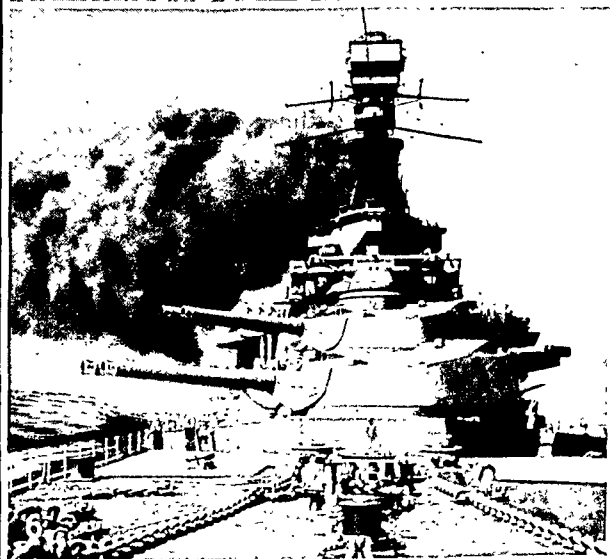
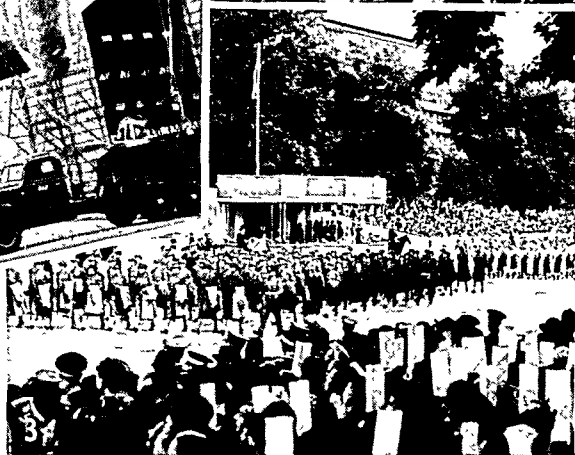
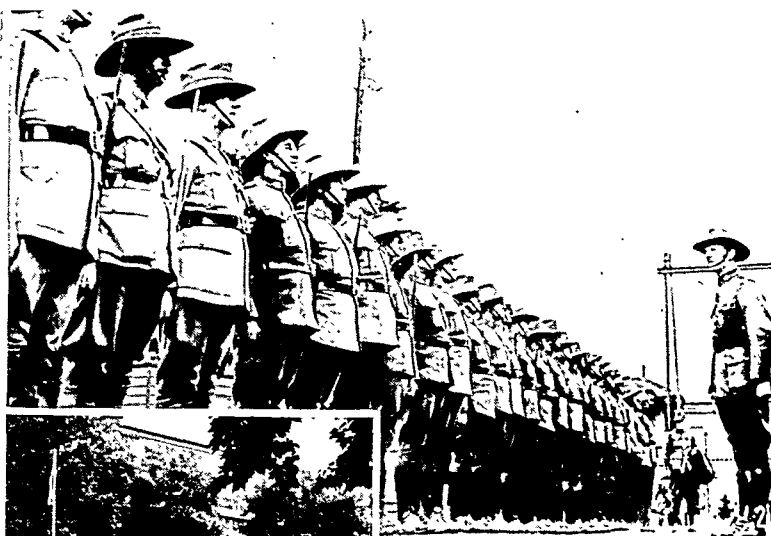
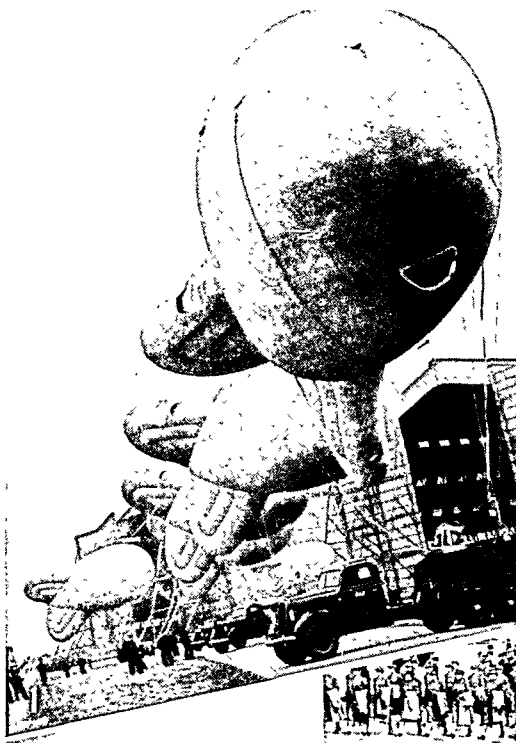


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3. NATIONAL SERVICE VOLUNTEERS MARCHING PAST THE KING AND QUEEN IN HYDE PARK IN JULY 1939 [Assoc. Press Photo

4. CANADIAN TROOPS DISEMBARKING ON THEIR ARRIVAL IN GREAT BRITAIN [Keystone

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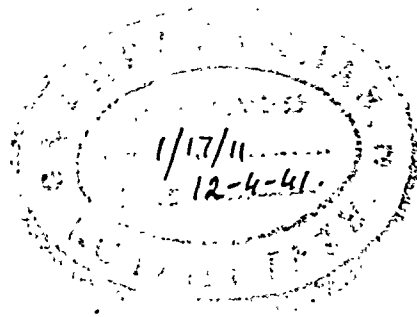
SUPPLEMENT

TO

1940

BRITANNICA BOOK OF THE YEAR

Recording developments of particular
interest to Great Britain and the
British Empire



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INTRODUCTION

THIS is the third year of publication of the BRITANNICA BOOK OF THE YEAR. In normal times this volume, which has now established itself as a much valued source of world-wide information on a vast range of subjects, appears in two issues, similar but different. One is designed primarily for the use of readers in Great Britain and the British Empire, the other for readers in the United States. The greater part of the text has always been common to both issues, the balance only in each of the two issues has laid respective emphasis upon the more purely domestic interests of the two sections of the English-speaking peoples.

This year various factors, the shortage of paper, its extremely high cost, the rapidly increasing costs of labour for printing and binding, war-risks insurance, would have combined to turn what has never yet been a profitable enterprise in Great Britain into a certain loss, had it been undertaken. With profound regret, therefore, the publishers had to content themselves on this occasion with the publication of one issue only, that designed primarily for the American continent. They are conscious, however, that the very conditions which have made the production of a separate British issue impossible raise some questions of particular and special interest to British readers, on which authoritative and dispassionate information is more than ever necessary.

The publishers have endeavoured to supply this need by means of a supplement to which this is the introduction. This supplement, containing upwards of 20,000 words, immediately follows. It has been edited and prepared in London with the collaboration of the foremost experts on the subjects discussed. The table of contents will show the unique authority of the contributors we have been fortunate enough to enlist.

The main part of this book is the BRITANNICA BOOK OF THE YEAR in its American form. As in previous years a very substantial proportion of the material is the work of the best European minds collaborating with American experts. We present this volume to our readers in the sure expectation that a view of the world seen from a neutral but friendly standpoint may prove of unique value at the present time.

M. D. LAW

LONDON, January 1940.

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By DOROTHY A. CANNELL

DIARY OF EVENTS THROUGHOUT THE BRITISH EMPIRE

EXCLUDING THE COURSE OF HOSTILITIES

From January 1st, 1939—December 31st, 1939

1939

Jan. 1 : **Palestine**.—Figures of casualties in 1938 were published showing 69 British killed, 92 Jews, 486 Arabs, and 1,138 armed rebels.

Jan. 2 : **Eire**.—A new Irish Association was formed to promote mutual goodwill and co-operation between the people of Eire and of Northern Ireland.

Jan. 12 : **Canada**.—Government proposals were put forward for augmenting the rearmament programme.

Jan. 13 : **Australia**.—Bush fires in Victoria swept huge areas killing 67 people and destroying much property.

Jan. 16 : **Great Britain**.—Arrangements were completed for the supply of steel air-raid shelters to occupants of small houses.

Jan. 17 : **Palestine**.—There was a new outbreak of terrorism.

Great Britain.—An auxiliary air force reserve was formed.

Jan. 19 : **Aden**.—Aden celebrated the centenary of British rule.

Jan. 21 : **Kenya**.—An Immigration Advisory Board was set up at Nairobi to control the influx of refugees.

South Africa.—The Union government bought a tract of farming land of some 700,000 hectares in S.W. Africa against bidding by the German government.

Jan. 24 : **Canada**.—A Defence Purchasing Board was established, and the government proposed to seek authority to borrow for the defence programme.

Jan. 25 : **Hongkong**.—A new air service was announced, linking Yunnan with Hongkong.

Jan. 27 : **Canada**.—A government investigation was ordered into allegations that Nazi propaganda was being conducted by German officials.

Jan. 29 : **India**.—Mr. Subhas Chandra Bose was re-elected president of the Indian National Congress.

Feb. 2 : **Transvaal**.—The value of the gold production in 1938 was stated to be £86,367,862.

Feb. 3 : **United Kingdom**.—Bombs exploded in two London tube stations. A round-up of Irishmen suspected of subversive activities in connexion with the I.R.A. began.

Feb. 4 : **Muscat**.—A new treaty of Friendship, Commerce, and Navigation was signed at Muscat (Oman) between Great Britain and India, and Muscat.

Feb. 6 : **United Kingdom**.—Mr. Chamberlain gave his pledge of immediate aid to France if her vital interests were attacked.

Australia.—The Federal cabinet decided to organize the country as a storehouse for the maintenance of her own people and to help the peoples of Great Britain in case of war.

Feb. 7 : **Palestine**.—The conferences between the British government and delegations of Jews and Arabs opened in London.

Feb. 9 : **Palestine**.—The Chief of the Im-

perial General Staff arrived in Jerusalem and inspected railway and other military posts.

Australia.—The minister for external affairs stated that owing to its position with regard to Papua and Australia New Guinea must be held at all costs.

Feb. 11 : **Australia**.—The first-line air strength was raised to 212 machines. A separate department for native affairs was created.

India.—Constitutional reforms involving greater co-operation with representative public opinion were announced by H.H. the Maharaja of Kashmir.

Serious rioting occurred between Hindus and Moslems at Cawnpore.

Feb. 12 : **Kenya**.—The report of a committee appointed to consider problems of land settlement was published.

Feb. 13 : **United Kingdom**.—Plans for the construction of permanent holiday camps for evacuated children were announced by the government.

Feb. 14 : **India**.—Proposals for the enforcement of prohibition in Bombay were made by the finance minister of the Bombay government.

Jamaica.—The island was placed under a "state of emergency" owing to a general strike order by workers' leader.

Feb. 16 : **Jamaica**.—The general strike was called off.

Feb. 19 : **British Guiana**.—An Anglo-American Commission was established to enquire into the possibility of refugee settlement in this colony.

Feb. 25 : **Malta**.—Royal Letters Patent were proclaimed granting a new constitution to Malta.

Malaya.—Further steps in the efficient organization of defence were taken and arrangements were made for the fortification of Penang.

Feb. 26 : **Palestine**.—There were a number of bomb and gun outrages.

Feb. 27 : **Canada**.—Alberta announced continuance of the default in interest payments.

Feb. 28 : **Australia**.—The Commonwealth recognized General Franco's government.

Channel Islands.—The Jersey States adopted a Bill authorizing a loan of £100,000 for defence.

India.—The Budget for 1939-40 was published. A surplus was to be acquired from doubling the Customs tariff on raw cotton.

Palestine.—A conference of all representatives of Palestine Jewry, save the Revisionists, opened in Jerusalem to discuss the British government's plan for a Palestine State.

Rhodesia.—A "Hands off Africa" conference was held at Bulawayo.

March 1 : **Kenya**.—The Order-in-Council reserving the Kenya highlands exclusively for European settlement came into effect.

March 3 : **India**.—In order to secure a more democratic form of government

in Rajkot State, Mr. Gandhi began a "fast unto death."

March 4 : **Canada**.—The admission in the spring of several hundred families of Sudeten German refugees was sanctioned.

March 7 : **India**.—Following intervention by the viceroy and settlement of the Rajkot State dispute, Mr. Gandhi ended his fast.

March 8 : **United Kingdom**.—Mr. Hore-Belisha, introducing the army estimates, reviewed in detail future plans for the British army.

Government assistance was promised in the creation of a £10,000,000 Chinese exchange stabilization fund.

March 16 : **Palestine**.—The British government's proposals for an agreed settlement were rejected by the Jewish delegation.

March 17 : **Palestine**.—The British government's proposals were also rejected by the Arab delegation.

South-West Africa.—Germany protested against immigration restrictions in South-West Africa.

March 20 : **United Kingdom-India**.—A new trade agreement was signed.

Palestine.—The National Council of Palestine Jews called a general strike as a protest against the British government's proposals for governing Palestine.

March 21 : **British Empire**.—Pledges of co-operation in maintaining the solidarity of the British Empire were given by Canada and Australia. In South Africa many recruits joined the Defence Force.

Palestine.—The Report of the British and Arab Committee on the McMahon Correspondence was published.

March 26 : **India**.—The Punjab government introduced a five-year programme to stamp out illiteracy in the province.

March 29 : **United Kingdom**.—Large prospective increases in the strength of the Territorial army were announced.

Australia.—The cabinet decided to undertake a compulsory national register of men between 15 and 64 years of age, and a voluntary register of women.

March 30 : **India**.—The Council of State passed a resolution approving the Indo-British Trade Agreement.

March 31 : **United Kingdom**.—Britain and France promised full support for Poland in the event of violation of her territorial integrity.

April 4 : **South Africa**.—In the greatest trial ever held in the Union, 458 native women were found guilty of murder by stoning a man to death.

April 7 : **Australia**.—Following the sudden death of Mr. Lyons, Sir Earle Page was appointed interim prime minister.

April 8 : **United Kingdom-United States**.—A 50-year agreement for the joint use of the Phoenix Islands was reached.

April 10 : **Palestine**.—Five British soldiers were killed by a land mine on the railway near Lydda.

April 13 : **Palestine**.—The Arab terrorists'

leader Aref Abdul Razzik surrendered to British troops.

April 14: **British Empire.**—A conference between Britain, New Zealand and Australia on defence in the Pacific Ocean was opened at Wellington, New Zealand.

April 15: **India.**—The Central Legislature rejected the Tariff bill embodying the terms of the Indo-British Trade Agreement.

April 17: **South-West Africa.**—In view of the international situation armed police reinforcements arrived from Pretoria.

April 18: **India.**—The Council of State passed the Tariff bill a second time.

April 19: **South Africa.**—A bill to incorporate police of South-West Africa with the Dominion force was supported by the House of Assembly.

Kenya.—The immigration authorities were empowered to demand a maximum bond of £500 from immigrants unable to return to their own countries.

April 21: **British Empire.**—Defence measures were announced for Southern Rhodesia, Kenya, Tanganyika, and Malaya.

April 22: **New Zealand.**—Drastic restrictions were imposed on imports in order to conserve the government's foreign exchange.

April 24: **Australia.**—Mr. Menzies, elected as Mr. Lyon's successor, formed a cabinet of members of the United Australia Party.

April 26: **United Kingdom.**—The government's plan for compulsory military service was announced in the House of Commons.

April 27: **Australia.**—The Federal government announced the creation of legations in Tokyo and Washington.

May 1: **United Kingdom.**—The texts of the government's Military Training and Reserve and Auxiliary Forces bills were published.

May 6: **United Kingdom.**—The King and Queen left England on an official visit to Canada and the United States.

May 8: **South Africa.**—Voluntary enrolment for the National Reserve began.

Malta.—A new British Institute was opened.

May 12: **United Kingdom.**—Mr. Chamberlain announced a pact of mutual assistance between the British and Turkish governments.

May 13: **United Kingdom.**—Bomb explosions, attributed to the I.R.A., occurred in London subways.

May 14: **United Kingdom.**—The B.B.C.'s first weekly news bulletin in Afrikaans was broadcast, and clearly heard in Capetown.

May 15: **South Africa.**—A supplementary barter trade agreement between the Union and Germany was signed at Capetown.

May 16: **Malaya.**—Substantial contributions to the cost of Imperial defence were made by a number of States.

Transjordan.—The British government agreed in principle to certain measures of constitutional reform.

May 17: **Canada.**—The King and Queen arrived at Quebec.

Eire.—Mr. De Valera protested against the conscription of Irishmen in Britain.

May 22: **Palestine.**—The British government issued its own proposals for the future government of Palestine in a White Paper.

New Zealand.—The prime minister

stated that if Britain were involved in a general war New Zealand would not stand apart.

Palestine.—Protests were made against the proposed abolition of the Balfour Declaration and a permanent minority status for Jews in Palestine.

May 23: **Palestine.**—The new plan as set forth in the White Paper was approved by parliament.

May 24: **Southern Rhodesia.**—The Otto Beit bridge over the Zambesi at Chirundu was opened.

May 25: **South Africa.**—Subscription lists for a £5,000,000 defence loan were opened, and closed on the same day.

May 27: **United Kingdom.**—New Anglo-French proposals for mutual defence by Great Britain, France, and the Soviet Union against aggression were delivered to the Soviet government.

May 29: **India.**—Settlements were made with the most influential tribes of the North-West frontier.

Burma.—The cabinet resigned, following the lead of the minister of commerce, who refused to resign when asked by the prime minister to do so.

May 30: **Australia.**—Refugee Jews in Western Australia asked for protection from Nazi interference.

Burma.—A new cabinet was sworn in, but with the same members as before except for the minister of commerce.

May 31: **Eire.**—Bill to suppress I.R.A. activities passed.

Palestine.—The Arab Higher Committee rejected the White Paper.

June 1: **United Kingdom.**—The submarine "Thetis" met with disaster, 99 men losing their lives.

The Soviet government replied to the Anglo-French proposals of May 27.

Australia.—A Department of Supply was created.

June 3: **United Kingdom.**—The first registration of men of 20-21 under the Military Training Act took place.

June 5: **India.**—The Indian Naval Reserve Forces Discipline Act was promulgated whereby four sections of reserves were created.

June 7: **Australia.**—A new sterling loan was issued to meet part of the defence expenditure.

British Empire.—The King and Queen arrived in the United States.

June 13: **Palestine.**—Ten bombs exploded at Tel Aviv.

The report of the Mandatory Power was placed before the League Mandates Commission.

June 15: **Palestine.**—Mr. MacDonald reviewed the situation and British policy in a speech to the Mandates Commission.

Canada.—The King and Queen sailed from Halifax for England.

June 17: **Burma.**—A commission was set up to enquire into alleged Indian penetration.

June 19: **India.**—Hindu-Moslem riots occurred at Cawnpore.

Palestine.—The disturbances continued; 18 Arabs were killed in a bomb explosion at Haifa.

June 23: **United Kingdom.**—A barter agreement was signed in London between the British and United States governments.

Eire.—The government denounced the Irish Republican Army as an unlawful organization.

July 1: **India.**—An Act for the registration of foreigners came into force.

July 2: **Canada.**—As from Sept. 24 the

Canadian Broadcasting Corporation proposed to assume control of all wireless broadcasting.

Australia.—The prime minister announced that in its international policy Australia stood with Britain, even if it were a question of war.

July 3: **Canada.**—The Social Credit Party merged with the New Democracy Movement under the combined name of the New Democracy Movement.

July 6: **Canada.**—The government disapproved of a proposed barter deal between Germany and Manitoba Province.

July 12: **Palestine.**—Immigration quota was suspended for 6 months owing to illegal immigration.

United Kingdom.—Agreements were signed in London whereby Greece and Rumania should make big purchases of British goods with the aid of guaranteed credits.

July 15: **United Kingdom.**—The first 34,000 militiamen commenced training.

July 17: **Palestine.**—Jewish protests against the suspension of immigration continued.

India.—Political and religious reforms for Hyderabad were announced.

July 20: **New Zealand.**—Britain granted credits for £9 million to finance imports from the mother country.

July 27: **United Kingdom.**—Further bomb explosions attributed to the I.R.A. occurred in London.

New Zealand.—A government conversion loan for £16 million was negotiated.

July 28: **United Kingdom.**—As Prevention of Violence Act became law, expulsion orders against 19 I.R.A. suspects were signed.

July 31: **British Empire.**—Troops were dispatched from India to Egypt and Malaya.

Aug. 1: **India.**—Prohibition of all alcoholic liquor began in Bombay.

New Zealand.—A state iron and steel industry was initiated.

South Africa.—The Union government began administration of the eastern portion of Caprivi Zipfel.

Aug. 10: **New Zealand.**—Trade talks with Canada began.

Aug. 14: **India.**—The Congress, Bombay, decided to boycott the Legislative Assembly during the coming session.

Kenya.—The British government promised a loan of £250,000 for the establishment of British settlers.

Aug. 16: **Palestine.**—The 21st Zionist Congress opened at Geneva.

Aug. 17: **Palestine.**—The Permanent Mandates Commission of the League of Nations maintained that the policy of the British White Paper was not in accordance with their interpretation of the Palestine mandate.

Aug. 18: **India.**—The R.A.F. bombed the headquarters of the Faquir of Ipi near Kharre.

Aug. 19: **South Africa.**—The German trade and payments agreement was renewed for one year as from Sept. 1. Purchases were fixed at £6,355,000.

Aug. 22: **Canada.**—The air transport agreement between Canada and the U.S.A. was concluded.

Kenya.—Government enquiries were opened at Mombasa and at Tanga into the causes of recent native labour unrest.

Aug. 23: **India.**—Tribal fighting continued on North-west frontier.

Aug. 24: **United Kingdom.**—The Emergency Powers (Defence) bill was passed

through all its stages, and received the royal assent.

Aug. 25 : **United Kingdom**.—The Anglo-Polish Agreement of Mutual Assistance was signed in London.

Aug. 26 : **United Kingdom**.—Sir Nevile Henderson arrived from Berlin with Herr Hitler's reply to a British Note.

Aug. 28 : **United Kingdom**.—Sir Nevile Henderson flew to Berlin with the reply to Herr Hitler's Note.

Aug. 30 : **Canada**.—A trade agreement was concluded with Turkey.

The British Government purchased 5 million bushels of wheat, part to be stored in Canada.

Aug. 31 : **United Kingdom**.—The evacuation of over 3 million children and adults from London and other crowded areas began.

Air services to the continent were suspended.

Sept. 1 : **United Kingdom**.—Following the invasion of Poland by German troops, the King signed an order for complete mobilization of the army, navy and air force.

Sept. 2 : **Eire**.—Mr. De Valera announced that Eire would maintain neutrality in the present European conflict.

Sept. 3 : **British Empire**.—Britain, Australia, New Zealand and Canada declared war on Germany, France having declared war on the same day.

A special war cabinet was formed in London.

Sept. 4 : **South Africa**.—General Hertzog's pronouncement of the neutrality of the Union in the war led to his defeat by 80 votes to 67.

India.—The government offered £34 million towards modernizing the defence force.

Sept. 6 : **South Africa**.—Following General Hertzog's defeat, General Smuts formed a war cabinet. War was declared on Germany.

Sept. 7 : **Australia**.—The entire militia force was called up for training.

Sept. 11 : **Australia**.—A special war cabinet was formed.

Sept. 12 : **Great Britain**.—The safe arrival of British troops and units of the R.A.F. in France was announced.

Sept. 15 : **New Zealand**.—Great Britain undertook the purchase of all surplus butter, cheese, meat, and wool.

Sept. 19 : **South Africa**.—All suspected aliens were interned at Bavianspoort.

Sept. 20 : **Australia**.—The government offered Great Britain the complete personnel of six squadrons for overseas service in 1939.

Sept. 21 : **Southern Rhodesia**.—Recruiting offices were closed, the supply of volunteers having exceeded the demand.

India.—One hundred and forty-one Indian princes offered their services to the King-Emperor, some offering troops, others gifts of money.

Sept. 22 : **British Empire**.—The King thanked the Sultan of Zanzibar, the Federated Malay States, and Kenya for offers of support.

Sept. 24 : **New Zealand**.—A division was offered for service overseas.

Sept. 25 : **Southern Rhodesia**.—The export of live cattle was forbidden in order to make available the maximum supplies of frozen meat for Britain.

South Africa.—A "South African Mayors' National Fund" was launched to raise at least £1 million for the pur-

chase of foodstuffs, etc., to be presented to the Allies.

Sept. 28 : **Canada**.—A war committee of the cabinet was created.

Sept. 29 : **India**.—The Aga Khan informed his followers throughout the world that it was their duty to co-operate in the service of the King-Emperor.

Bahrein.—The Sheikh of Bahrein offered £30,000 towards the cost of the war, as he had no army to offer.

Sept. 30 : **Australia**.—Sales to Great Britain of all surplus wool, meat, dried fruit, eggs, cheese, and sugar were arranged.

Oct. 1 : **South Africa**.—The formation of a South African Irish Regiment was sanctioned.

Oct. 4 : **New Zealand**.—A battalion of Maoris was formed for home or overseas service.

Oct. 5 : **Australia**.—The Commonwealth treasurer was empowered to acquire foreign securities owned by Australians and other property abroad.

Oct. 6 : **New Zealand**.—The government was given full control over currency and credit and authorized to acquire and handle all surplus produce.

Oct. 10 : **Burma**.—A defence council was set up.

Oct. 11 : **India**.—A volunteer scheme for the regular Indian army was introduced.

Oct. 15 : **Canada**.—The British air mission, headed by Lord Riverdale, arrived in Ottawa.

Oct. 16 : **New Zealand**.—Men enrolled in the national military reserve totalled over 35,000.

Oct. 17 : **India**.—The Viceroy reaffirmed British government's view that dominion status achieved by constitutional changes was India's natural destiny.

Oct. 18 : **India**.—Congress leaders expressed dissatisfaction with the viceroy's statement.

Oct. 19 : **Great Britain**.—The Anglo-French treaty with Turkey was signed in Ankara.

Oct. 24 : **Kenya**.—Austrian and German refugees volunteered in military and other capacities.

Southern Rhodesia.—The government offered to maintain three air squadrons in the field.

Oct. 28 : **Canada**.—Contracts were signed for the supply to Great Britain of 420 million lb. of electrolytic copper, to be delivered within 12 months.

Oct. 30 : **South Africa**.—A Foreign Legion was established following many offers by aliens to serve in the forces.

India.—Several Congress ministers resigned.

Oct. 31 : **British Empire**.—Discussions on Empire co-operation began in London between cabinet ministers and Dominion ministers.

India.—The creation of a permanent Indian air force volunteer reserve was authorized.

Nov. 1 : **Kenya**.—The governors of the East African territories and of Nyasaland and Northern Rhodesia, and the resident of Zanzibar, met in Nairobi to discuss their own defence and the help to be given to the Empire.

Nov. 6 : **Canada**.—Delegates from Australia, Canada, New Zealand, and Great Britain met at Ottawa to discuss Empire air training.

Nov. 8 : **Burma**.—In reply to a communication of Oct. 12, the British government reaffirmed its intention to

assist Burma to attain her due place in the Commonwealth of Nations.

New Zealand.—The Centenary Exhibition was opened at Wellington.

Nov. 11 : **Palestine**.—An improvement in the general security of the country led to the release of a large number of Arabs in time to celebrate Id el Fitr.

Nov. 13 : **South Africa**.—A South African seaward defence force was created.

Canada.—By an order-in-council the rate of sterling for duty purposes was lowered from its parity of \$4.86 to a selling rate of sterling daily declared by the Foreign Exchange Control Board; a concession about equivalent to a 9 per cent reduction in Customs duties.

Nov. 15 : **India**.—The Assam ministry resigned, thus completing the resignation of all the Congress ministries in the eight provinces of British India.

Newfoundland.—A very successful response was reported for recruiting for the Royal navy.

Nov. 17 : **India**.—Budshah Gul, the Mohmand leader, advised his followers to co-operate whole-heartedly with the British.

Nov. 19 : **British Empire**.—Gifts of money were made by Trinidad, Barbados, and Sarawak to the British government.

Nov. 22 : **Cyprus**.—2,000 Cypriots volunteered for service with the British forces.

Canada.—65,000 troops were declared mobilized.

Dec. 5 : **Eire**.—The creation of a new marine service costing £250,000 was announced.

Dec. 9 : **Canada**.—The Royal Canadian air force announced 6,500 applications since September.

Dec. 15 : **Australia**.—Australia offered 26,000 men for the Empire air training scheme.

Dec. 17 : **Canada**.—Representatives of Great Britain, Australia, Canada, and New Zealand signed the agreement for the Empire air scheme in Ottawa.

The first contingent of Canadian forces landed in Britain.

Dec. 19 : **Aden**.—A contraband control base was established at Aden.

Dec. 20 : **British West Indies**.—An order-in-council fixed Jan. 1, 1940, as the date for the transfer of Dominica from the Leeward Islands group to the Windward Islands group as a separate colony.

Australia.—The prime minister, in a national broadcast service, emphasized that Australia would only leave the war as victors.

South Africa.—The offices of several German organizations were raided and large quantities of documents seized.

Dec. 22 : **Canada**.—The British ministry of food arranged to purchase from Canada an average weekly amount of 5,600,000 lb. of Canadian bacon and hams.

India.—The day was observed by Moslems as one of "deliverance," and as "a mark of relief that the Congress governments have at last ceased to function."

Dec. 26 : **Australia**.—The first contingent of Australian troops arrived in England.

Dec. 27 : **India**.—The first Indian contingent arrived in France for service on the Western Front.

Dec. 28 : **Kenya**.—The war office in London assumed complete financial responsibility (as from Sept. 1, 1939) for all military expenditure during the war throughout East Africa.

AIR RAID PRECAUTIONS

AIR RAID PRECAUTIONS. The vital importance of civil defence in modern warfare, so vividly demonstrated in the attacks on Abyssinia, Spain, China, Poland, and Finland, was recognized in a practical form by Britain in 1937, by the passing of the Air Raid Precautions Act. The events of 1938 intensified preparations; a ministry of civil defence was established, gas masks were issued, trenches dug, and the nucleus of an A.R.P. service enlisted. Early 1939 saw further significant developments.

Shelters. A major consideration has been the provision of some adequate light-bomb, blast-, and splinter-proof shelter scheme. The compulsory provision of air raid shelters is regulated by the Civil Defence Act 1939. They are of three main categories, namely, public shelters provided by the local authorities, private shelters by the owners of factories, mines, and commercial buildings, and private shelters by public utility undertakings.

The local authorities are under an obligation to construct public shelters for persons who may be caught in the street during an air raid, the number for whom provision is made varying from ten to fifteen per cent of the normal population of the area. Such shelters usually take the form either of specially constructed brick or concrete chambers above or below ground, or partly both, or else of existing buildings or portions thereof, adapted and strengthened. Of the public shelters good examples are to be seen in parks where light-bomb resisting trench-shelters of reinforced concrete are built below ground, use being made of the tamping effect of the soil. In streets where houses are of very light construction, medium sized above-ground brick shelters have been built in closely populated areas and in busy shopping centres. Where they exist basements have been utilized and strutted or otherwise strengthened where a floor above suffices to enable them to withstand a debris load.

The Home Office has issued memoranda to deal with almost every reasonable situation, giving general rules and specifications that the builder can follow. Sanitary accommodation and emergency lighting are catered for, and providing that the local authorities have tackled this responsibility seriously, reasonable shelter accommodation should be afforded for the best part of the working and shopping communities.

The local authorities are also responsible for the provision of shelters at or near their homes, for those citizens whose family incomes do not exceed £250 per annum. These sometimes take the form of steel sectional shelters known as "Anderson" shelters and so named after the minister of home security. They afford protection for six persons and are suitable for small houses or villas with gardens.

Where such steel shelters are not suitable brick or concrete communal shelters are constructed or the actual houses themselves are strengthened.

Many thousands of Anderson shelters have been delivered free to the poorer people who have asked for them. The shelter problem has been given a great deal of attention, but largely through inexpert choice of ground or of the most suitable kind of shelter, water and dampness have made a proportion of the shelters unsatisfactory. This is being remedied by the local authorities, though in some cases only after considerable delay.

In certain specified areas, *i.e.* those in which air attack is likely to be most severe, the owners of all factories, mines,

and commercial buildings in which more than fifty persons work, are required to provide shelters conforming to a prescribed standard. Such owners receive a grant from public funds in respect of approved capital expenditure of an amount in the pound equal to the standard rate of income-tax for the year 1939-40.

All public utility undertakers, including such services as gas, electricity, water, railways, docks and harbours, etc., have the duty of taking such measures as may be necessary to ensure the proper functioning of these services during air raids and of providing shelter and such special protection or equipment as may be necessary for their staffs. For expenditure on such matters the undertakers will receive certain grants from public funds.

In the case of blocks of flats, the owner must, if requested by a majority of its tenants, provide air raid shelter for them, but is entitled to recoup himself by increasing rents on a specific basis. Where, however, the majority of the tenants are of the class who would be entitled to free materials for air raid shelters (*i.e.* of the income class before referred to) then the local authority may construct the shelter at the public expense.

Legislation. The Civil Defence Bill referred to above was introduced by Sir John Anderson on March 23, 1939, and was intended to increase the country's preparedness to meet air attacks. It conferred on local authorities the right to enter private premises in order to carry out A.R.P. work and to acquire land for shelters. It imposed upon employers the obligation of providing protection for their workpeople, and also provided for the incorporation in new buildings of structural precautions and air raid shelter. It allowed for a fifty per cent grant for public utility services towards the cost of special A.R.P. provision to ensure these services functioning in war time. It imposed camouflaging and darkening regulations, arranged for evacuation of women and children where advisable, and generally tackled A.R.P. problems to compete with large-scale and frequent air attack.

The shelter and material provision has been a very costly business but a very necessary one.

Personnel. The A.R.P. personnel has been made up mainly of: fire-fighters; rescue and decontamination squads; stretcher bearers; ambulance staff; air raid wardens; repair parties; control and reporting personnel; despatch riders; and extra police. In addition there are numerous civil engineers and other skilled technicians who have made preparation for dealing with the possible damage to water mains, gas, and electric installations.

Well over a million people are enrolled in civil defence. Many who can afford it are giving full-time voluntary service—among them women and girls who drive cars, lorries, and ambulances, cater for those on guard, work telephones, serve in canteens, and so on. A great number of other women, less well placed financially, receive a salary as A.R.P. workers of £2 a week.

The men employed in this great organization come from every rank and grade and also include both volunteers and paid workers, a man's salary on A.R.P. work being £3 a week. Many of the older men are manning wardens' posts or engaged in night patrol. Senior Scouts and Rovers are likewise rendering valuable service.

Since A.R.P. has been taken in hand seriously great efforts have been made to exercise the personnel, and in some regions these emergency services have attained a high

standard of proficiency. The fire brigade exercises alone have reached a scale hitherto undreamed of, and it is no unusual thing to see the London Fire Brigade employing five hundred pumps at once.

The ambulance and stretcher-party workers are exercised almost daily, and their training has been well carried out. In this connexion large lorries, suitably selected, and in some cases motor-omnibuses, have been converted into what are known as mobile hospital units. It takes little more than five minutes from the time of arrival of one of these vehicles with a complement of a doctor and half a dozen nurses to improvise a small hospital in a hall, house, or even in the open. The staff are prepared to carry out amputations and other operations if the need should arise. The medical services have responded admirably, and enthusiasm and energy have been put into the training of first-aid personnel.

The air raid wardens have generally taken great trouble to make themselves efficient. Wardens' posts, which should be blast and splinter proof, have been built according to special standards all over the country, and rendezvous have been selected and their positions made generally known so that rescue and first-aid parties can reach them at short notice, and be conducted to the scene of the bombing without delay.

The training of rescue and decontamination squads has reached a high standard. This includes rescuing people buried under heavy debris or from the topmost storeys of high buildings, cutting through steel girders, clearing roads of smashed up and overturned vehicles, and decontaminating large areas after poison-gas raids, in addition to cleansing the personnel itself. Decontamination stations are provided where they are considered necessary.

In addition to the foregoing, squads have been trained and are kept in readiness to deal with electrical, gas, and water breakdowns up to the largest imaginable scale. Sluice gates have been provided where underground railways pass below rivers, and never in any nation's history has so much attention been given to this vital civil defence problem.

Everyone in the country has been given a respirator and a serious appeal has been made to the public to carry their gas masks always. The response has not been as good as it should be.

In conclusion, the control and reporting centres should certainly be mentioned. Such a network of control has been built up that it is believed that in the worst breakdown conceivable communication can be maintained, and that no air attack, however large the scale, can be carried out without all available resources being rushed to the centre of damage in the minimum of time.

See also EVACUATION; WELFARE AGENCIES, WAR; WOMEN'S WAR ORGANIZATIONS. (E. Ev.)

ECONOMIC WARFARE. On Sept. 5 an order in Council (S.R. & O. 1939, 1188) based on the Ministers of the Crown (Emergency Appointments) Act established a ministry of economic warfare, which, as the official statement explained, corresponded broadly to the ministry of blockade set up during the last war. Mr. R. H. Cross, the former parliamentary under-secretary to the Board of Trade, was appointed minister. Sir F. Leith Ross, the chief economic adviser to the government, was made director general, and Sir G. Mounsey, of the Foreign Office, secretary to the ministry.

Within a few days of the outbreak of the war the ministry was at full work, staffed mainly by experts drawn from

business life. In this field the lesson of the last war had not been forgotten. The vital task of denying essential supplies to the enemy was not, as at the beginning of that war, entrusted to a section of the Foreign Office advised by a committee of experts and working through various executive departments. It was recognized that this task was basically different, indeed in certain respects opposed to that of the Foreign Office, whose chief duty is to maintain friendly relations with neutral powers. Close co-operation was immediately established between the ministry and its counterpart in France and all measures taken carefully synchronized.

Contraband Control of German Imports. The proclamation specifying the goods which would be treated as contraband was ready on Sept. 3. It followed closely the precedent established by the regulations laid down by the United States government in the last war, when the Declaration of Paris of 1856 and the London Declaration of 1909 were abandoned. This was a very important advantage, since in 1914 the self-denying acceptance of the London Declaration—though it had not been ratified—for some time prevented the Powers of the Triple Entente from impeding even vital supplies to Germany.

The first list of firms deemed to be enemies under the Trading with the Enemy Act was also issued almost immediately. Further lists followed. The unrivalled facilities of the City of London as traders and bankers were placed at the government's disposal for securing information on the operations of other firms which might be tempted by high profits to supply goods to the enemy.

At Kirkwall, Weymouth, the North Foreland, Gibraltar, and Haifa control bases were set up by the Admiralty. The cargo manifests of all ships passing through to neutral ports in territories directly or indirectly contiguous to Germany are examined by the ministry of economic warfare. If a cargo should prove suspicious the case is brought before the Contraband Committee, a semi-judicial body, which examines whether a *prima facie* case has been made out by the department justifying its detention. Finally the prize courts set up under royal patent decide whether the goods and ships are liable to seizure or not.

In order to avoid the long delays, inevitable early in the war, as almost each case presented complex problems, the system of "Letters of assurance" (navicert) was reintroduced in Nov. 1939. Prospective shippers of goods to countries contiguous to Germany submit their plans in advance to British consuls overseas who then issue certificates. Ships covered by certificates are not held up in the contraband control bases. By this means and by the gradual enlargement of the staff of the ministry, unnecessary frictions with neutral countries are slowly being eliminated.

Contraband Control of German Exports. Early in the war no action was taken with respect to German exports, though an analogous policy in the beginning of the last war seriously weakened the effectiveness of economic warfare. But in retaliation to the continued and increasingly flagrant disregard by the Nazi government of international law at sea, manifested by the sinking of merchant ships without warning, air attacks on merchant vessels and the sowing of "magnetic" mines, an Order in Council was issued (effective Dec. 4) ordering the confiscation of all German exports seized on the high-seas. It appears that the Nazis are trying to evade this further blow at their capacity to acquire directly or indirectly foreign supplies. The minister of economic warfare stated in the House of Commons on Jan. 16, 1940, that the Order

itself was sufficient to throttle a greater part of Germany's exports overseas. It will be applied with increasing efficacy, though in certain exceptional cases specified shipments essential to neutrals overseas will be permitted to pass.

Special measures are also being taken to prevent Germany from using her financial resources for replenishing her supplies, and a special department was created for the purpose, working in close co-ordination with the powerful financial organizations in Allied countries.

Negotiations with Neutral Countries. To stop the loopholes by which essential war supplies are reaching Germany, information and statistical material regarding adjacent neutral countries are being accumulated. There seems to be no need for the establishment of special trading organizations such as, *e.g.*, the Netherlands Overseas Trust in Holland and the *Société de Surveillance Economique* in Switzerland. The foreign trade of neutral countries is to a far greater degree under direct government control than in the first period of the last war. Thus direct agreements similar to those negotiated in 1918 with the governments concerned will probably suffice.

Factors of assistance in this collection of information are the widespread business organizations of Britain and its Allies. The ministry can also draw on more direct sources, among which the statistics based on ships' manifests are perhaps the most important. As time passes these trade statistics will give an increasingly accurate picture of the position of all materials imported from overseas into the "controlled area" adjoining Germany. Thus the discontinuation of the publication of official trade statistics need not hamper the British authorities in the execution of their task. The production of this "controlled area" is, of course, not covered by these figures, but it will probably be possible to obtain fairly accurate information about it either by agreement and/or on the basis of the import figures, as there are few products whose production or manufacture does not demand overseas supplies. The bargaining power inherent in the command over the sea routes should also be of material assistance.

Negotiations with neutral countries adjacent to Germany were started soon after the outbreak of war. Agreements were concluded with several of them—*e.g.* Italy, Sweden—after long discussions. In other cases conversations still continue. The text of these agreements has not been published. It is understood that in certain cases the agreement included a regulation of trading between the neutral country and the Allies. The rate of exchange between the national currency of the neutral and sterling as well as francs was fixed. Provision was made also for the payment for purchases by the Allies in the neutral country partly by gold and free foreign exchange, partly in sterling (francs) to be expended within the confines of the British and French Empires—except those parts which belong to the dollar block. It is not known whether and on what basis imports from overseas of essential war-materials and food-stuffs likely to be of utmost use to Germany into contiguous and quasi-contiguous countries are now regulated.

Rations imposed on these countries during the last war were usually equal to pre-war imports less exports and any increase of the production of the product as had occurred during the war. Special attention was at that time paid to commodities which were imported into the contiguous neutral country not for the purpose of consumption but for processing, manufacture, and re-export.

The agreements prevented the re-exports from taking an undesired direction.

It seems that—at any rate in certain cases—the present intention is to fix import quotas for these countries by negotiation. This procedure has serious drawbacks. Its operation is not mechanical and therefore may lead to friction not only between foreign countries and the Allies, but also between the government departments entrusted with the execution of different aspects of policy. It is to be feared therefore that these agreements may err on the side of too great a leniency. There is the added complication at present that the pre-war statistics of foreign trade could hardly provide an adequate basis for the interception of essential supplies to Germany. Apart from the technical progress which shortens the time necessary to readjust the economic structure of a country to the loss of supplies (and in most cases decreases the loss suffered thereby) the choice of a base period is most difficult. The pre-1914 figures were characteristic for peace economics, and also gave an adequate picture of potential productive capacity, but statistics concerning the last few years are deficient in both directions. The world has gone through a period of continuous and severe economic instability, not merely since 1929 but, if the consequences of economic nationalism, or autarchy, are to be taken into account, ever since 1914. Hence some arbitrariness in fixing rations cannot be avoided.

Future Policy. What then are the prospects for the future? The most important difference as compared with 1914 lies in the fact that Germany has systematically prepared her economic structure against "economic blockade", and accumulated very considerable stocks of essential raw materials, foodstuffs, and finished military and civilian supplies, partly by enforced collective saving, partly by looting the countries she overran. The Austrian, and Czech gold and foreign exchange reserves, which were handed over *in toto* or partially to the Nazis by the two Western Powers, represent merely a portion, though a valuable portion of this loot. Germany undoubtedly possesses very much less foreign assets including gold than in 1914, but whereas Imperial Germany never used her reserves fully the Nazis have not only utilized them but are increasing them by various devious methods (repatriation of Germans, demand for payment on pre-1914 loans, etc.). They have, furthermore, introduced a draconian control of consumption and foreign trade, so that the wastage of raw materials and foreign assets which occurred in 1914 and 1915 will not be repeated. On the contrary, the Nazis have an exact knowledge of, and power over, all stocks of vital supplies now in Germany. Nor are they so cut off, as was Imperial Germany from all important sources of supply though they lack the domination of the iron and coal supplies of France and Belgium. They have assiduously cultivated trade with the areas which they hoped to be able to reach even in case of war. The overvaluation of the Reichsmark relative to the so-called "free currencies" in these countries, which made it profitable for them to sell to Germany, coupled with clearing agreements which forced them to expend the proceeds of their exports in Germany, has tended to adapt the productive structure of these countries to Nazi needs. At the same time in the crucial period after 1931, Britain and France, for different reasons, both indulged in prohibitive measures such as quotas, the Ottawa system of preferential tariffs, etc., against the main exports of exactly these countries.

A diversion of supplies from the Nazis would therefore

involve competitive selling of manufactures now obtained by the contiguous countries in Germany, and competitive bidding for supplies now sold to Germany. In so far as the overvaluation of the mark continues and the Nazis use their control over economic life to sell and buy in these countries regardless of cost this cannot be accomplished by private enterprise of the Allied countries, as the transactions would result in a loss to the British trader. Yet the necessity for such active economic warfare is plainly shown by the fact that almost one half of Germany's total trade immediately prior to the war was conducted with countries to which she has direct access. If trade between the Soviet and the Nazis should regain its former importance, a possible though not—on account of transport difficulties and the increased internal demands of Russia—a probable contingency, the proportion of trade which the Nazis could theoretically maintain in spite of naval or military measures of the Allies rises to some sixty per cent of pre-war. It is true, of course, that part of the trade which Germany has conducted with neighbouring countries represents trans-shipments from overseas reaching the Nazis through neutrals (*e.g.* Holland and Belgium) which will be stopped by measures of the Allies. On the other hand the Nazis can redirect their exports to overseas countries to contiguous countries and thus obtain more of the production of these countries.

Whilst such redirection of the export trade could solve the import problem of Germany if she could obtain the total production of such countries, as far as food supplies are concerned (with the possible but not certain exception of fats), it cannot bridge the gap without overseas supplies in petrol, certain rare metals, textile fibres, and rubber. The 1938 figures of German imports include, however, very considerable supplies not needed for current consumption but for the building up of stocks, and the consumption of certain goods could be forced even below the low standard which obtained in Germany throughout the pre-war period. Moreover, there are considerable idle resources of labour in most of the neighbouring countries, and given efficient reorganization their productivity could also substantially be increased. Hence the possible alleviation of the shortage of materials suffered by the Nazis by an increase of imports from such countries may be considerable.

These considerations suggest that the interception of enemy supplies from overseas must be vigorously supplemented by active economic warfare—*i.e.* both selling against Germany and buying up supplies she needs, in neighbouring countries, if quick results are to be obtained. Furthermore, German stocks are not being exhausted and German productive power is not being encroached upon at present in a way corresponding to 1914-18. Available labour force is not being depleted by casualties, and there is no wastage of material in active hostilities. The considerable rise in German exports to neighbouring countries at favourable prices does not altogether bear out the contention that all that is possible to do in this respect has already been accomplished by the Allies. Fortunately most of these neutrals used the proceeds of German exports to reduce their earlier credits to Germany. If they do not obtain the products they need from the Allies they will, however, soon be forced to sell to Germany.

A policy of active economic warfare would inevitably involve a worsening of the Allied terms of trade already burdened by the war effort. The Allies must, therefore, if they wish to avoid the premature exhaustion of their gold and other foreign reserves, however great they may be,

take active measures to improve their terms of trade with the rest of the world. It also implies a readiness and capacity to sell products of which Germany is a potential supply, and often at "uneconomic" prices. This in its turn will depend on the successful mobilization of the potential productive capacity of the Allies and its efficient use in foreign trade (an undervaluation of the mark relative to sterling and the franc would very much facilitate this endeavour). It would probably also involve a limitation of the Allies' civilian consumption. Moreover, to stop German supplies the Allies must be prepared to promise effective military aid to the neutrals adjacent to the Nazis, for otherwise they will not dare to refuse German dictates. This postulates a decided superiority in striking force, which must be crushing, because the Nazis once more possess the advantages (as they suffer from the drawbacks—*i.e.* the possibility of cutting their communications with overseas) of being able to move their forces along the shorter central routes. Thus the waging of a successful active economic warfare depends on the whole system of economic war policies and their co-ordination. (*See* INDUSTRY, WAR CONTROL OF; also WAR FINANCE; and WAR POTENTIAL OF LEADING EUROPEAN COUNTRIES.)

(T. BA.)

EMERGENCY LEGISLATION. When a state of emergency arises in a constitutional country such as Great Britain the procedure and the powers normally vested in the executive may be quite inadequate. This was so at the outbreak of the war. New laws and new powers became necessary, and citizens, as a whole, were ready to give up many of their cherished rights in order that the executive might be vested with full powers, so as to bring the war to a successful conclusion.

On Sept. 3, 1939, His Majesty's government was well prepared in this respect. A vast body of legislation, statutes, rules, orders, and regulations was already prepared in draft form for presentation to parliament. During the period from Sept. 1 to Dec. 14, 1939, about sixty Acts were passed, and about eight hundred rules, regulations, and orders made, which have profoundly affected nearly every aspect of national life. It is almost impossible to give any adequate description of their range and power, but some idea may be gained when it is realized that they affect agriculture, industry, commerce, civil defence, copyright and patents, the law courts, the administration of justice, education, customs and excise, employment, insurance, landlord and tenant, local government, finance, pensions, police and firemen, road and rail traffic, shipping, and air navigation.

Procedure. His Majesty the King, with the advice of his Privy Council, can now make Orders in Council and Proclamations which have the force of law. As it is impossible to legislate for every detail of an emergency, parliament frequently delegates its powers in certain cases to ministers of the Crown and to officials, giving the respective minister official full powers to make regulations or orders which have the power of law.

The general effect of this legislation on industry and commerce, civilians, the constitution, public authorities, and the armed forces, can be best considered by dealing with these phases separately.

Industry and Commerce. *The Civil Defence Act 1939* amended the *Air Raid Precautions Act 1937* and they should be read together. By these Acts local authorities are compelled to make schemes for the protection of persons and property from hostile air attack. Basements may be

commandeered for use as public air raid shelters. If necessary, the Crown will supply materials for the strengthening of such basements, but the local authority must carry out the necessary fixing. Owners of factories, mines, and public utility undertakings are under a duty to screen all lights and to regulate flames or glare, and, if necessary, to camouflage their buildings. They may receive a grant towards the cost but such grant must not exceed one half of the expenses. Premises or vehicles may be requisitioned and land may be compulsorily hired for civil defence. Where orders are made for the requisition of premises or vehicles, or which relate to local authorities in London, they must be laid before parliament. The same applies to any Treasury scheme made under the Act, and if parliament resolves that such order, regulation, or scheme should be annulled, then it will be void.

The Compensation (Defence) Act 1939 provides for the payment of compensation to those who own property which has been temporarily possessed or controlled by the government in the exercise of emergency powers. No provision is made for the loss of goodwill of trade, profession, or business caused through the taking or controlling of premises or land, nor for deterioration or loss incurred where movable assets have had to be moved in pursuance of emergency powers, although a claim may be made for expenses actually incurred through carrying out orders.

The Finance (No. 2) Act 1939 reintroduced the excess profits tax. The tax is chargeable on the excess of profits made over the standard profits during a chargeable accounting period. The standard profit is computed by reference to (1) a minimum amount; (2) profits of a standard period; or (3) the statutory percentage of the average amount of capital employed in the business. The tax, which is three-fifths of the excess profits, is payable one month after assessment, and applies to all trades or businesses of any description carried on in the United Kingdom or abroad, personally or through an agent, by persons ordinarily resident in the United Kingdom. The national defence contribution is a duty imposed by the Finance Act 1937 for a period of five years from April 1, 1937. It is chargeable on a percentage of the profits of a business, whether or not there is an excess. Whichever is the higher is payable, but if both are equal, then excess profits duty is payable. The national defence contribution is a tax of five per cent of profits in the case of a body corporate, and four per cent of the profits in any other case.

The War Risks Insurance Act 1939 deals with insurance of ships and cargoes and with compulsory insurance by sellers of certain goods; but compulsory insurance is not necessary where the value of all the goods for the time being owned by a person in the course of business does not exceed £1,000. The insurance is undertaken, organized, and financed by the Board of Trade.

The Import, Export, and Customs (Defence) Act 1939 controls the inward and outward trade and the shipment of goods as ships' stores. If goods are shipped in defiance of the Act, they may be forfeited as prohibited goods, and severe penalties may be imposed.

The Liability for War Damage (Miscellaneous Provisions) Act 1939 is not limited to the present emergency. It is designed to relieve certain classes of persons from liability under contract, statute, or common law in respect of loss or damage by war. It affects bailors and bailees; buyers of goods on sale or return; innkeepers; pawnbrokers; and persons liable for custom and excise duties (including warehousemen).

The Prices of Goods Act 1939 was passed to prevent the price of goods specified by the Board of Trade being raised above a basic price for those goods by more than an amount referable to increases in certain specified expenses. Basic price means the price of such goods offered for sale on Aug. 21, 1939. Many orders and regulations have now been made for setting up control committees.

Constitutional. *The Ministry of Supply Act 1939* confers very wide powers on the minister of supply with regard to articles required for public services. He may grant loans for augmenting stocks or improving facilities for the storage of articles required for the public service. He may regulate and control the business of anyone dealing with such articles, and he is given extensive powers to insist upon production of information and returns. He may insist on priority being given over all other work and he may insist upon any person accepting a contract required for the public service on reasonable terms.

The Courts (Emergency Powers) Act 1939 was designed to prevent the enforcement of any judgment or order (with certain exceptions) by way of execution or bankruptcy or, in the case of a company, by execution or winding-up by the court unless leave of the appropriate court is first obtained. Judgments or orders, subject to exceptions, consist of judgments and orders for the payment of money whether judgment given before or after the commencement of the Act. Exceptions are judgments for the recovery of damages in tort, judgments on orders relating to contracts made after Sept. 2, 1939, judgments or orders relating solely to the recovery of costs, bastardy orders, orders enforceable as affiliation orders, and orders made in criminal proceedings or for the recovery of a penalty under a statute. The Act also prevents a landlord from enforcing judgment for possession in default of payment of rent or a mortgagee from recovering possession by reason of a default in the payment of money, except by leave of the appropriate court.

The Administration of Justice (Emergency Provisions) Act 1939 provides for the removal of the supreme court and other courts. It reduces the number of jurors from twelve to seven in criminal cases and does away with the right to a jury in civil cases. The Act also gives unrestricted power to magistrates to remand with or without bail for twenty-one clear days.

The Currency (Defence) Act 1939 allows the Treasury for certain purposes to cause the funds in the Exchange Equalization Account to be invested in the securities, assets, or the currency of any country, or to be used to purchase gold or silver.

The Emergency Powers (Defence) Act 1939 is of great importance in so far as the King in Council has the power, both directly or by delegation, to override any other Act of Parliament. The Act empowers His Majesty by Order in Council to make defence regulations and such regulations may amend, suspend, or apply any Act. The Act also provides for the hearing of proceedings of every kind in camera whenever the court thinks fit. It also extends the operation of legislation and regulations outside the United Kingdom. This Act is for a period of one year, but it may be renewed for a further period of one year on an address presented to His Majesty by each House of Parliament.

Civilians. *The Finance (No. 2) Act 1939* increased income-tax, surtax, estate duty, and custom and excise duties. The standard rate of income-tax was increased from 5s. 6d. to 7s. 6d. in the £ as respects the last three-quarters of the year. For 1939-40 the increase is averaged

over the whole year so as to result in a standard rate of 7s. in the £. In addition to increasing the rate of income-tax the Act also modifies personal allowances for the year 1940-41. Surtax is increased varying from one shilling and threepence for every £ of the first £500 in excess over £2,000 to nine shillings and sixpence for every £ in excess of income over £10,000 per annum. Estate duty rates are increased by one-tenth where the estate exceeds £10,000, but does not exceed £50,000. For all estates exceeding £50,000 the rate is increased by one-fifth. The Act also increased the duties on beer, spirits, wines, tobacco, sugar, molasses, glucose, and saccharin. The Act also makes provision for granting relief to persons whose incomes have been reduced owing to circumstances attributable either directly or indirectly to the war.

The Landlord and Tenant (War Damage) Act 1939 only operates when war damage occurs. It is designed to relieve tenants of the obligation to repair the damage, and under certain circumstances to relieve the tenant from payment of rent for the damaged property. If premises are rendered unfit by war damage, the Act provides for notices and counter-notices to be served. If a contract contains a provision imposing a liability to make good war damage it is treated as void.

The Possession of Mortgaged Land (Emergency Provisions) Act 1939 was passed to restrict the rights of mortgagees to obtain possession of mortgaged land and to amend the Courts (Emergency Powers) Act 1939.

The Personal Injuries (Emergency Provisions) Act 1939 operates during the present emergency, and provides for the payment of pensions or weekly injury allowances in respect of war injuries received by civilians.

The Rent and Mortgage Interest Restrictions Act 1939 will continue in force until six months after the duration of the present emergency. This Act applies the principal Acts of 1920 to 1933 to approximately ninety per cent of all dwelling houses, as the previous Acts had only imposed control on houses completed before April 2, 1919, and most of these houses had been decontrolled by the operation of successive Acts. Many had become decontrolled by the landlord gaining possession, but by section 2 of the 1939 Act this mode of decontrol is abolished.

The National Registration Act 1939 was passed to enable authorities to establish a national register of all persons resident in the United Kingdom at midnight on Sept. 29, 1939. Identity cards were issued to every registered person for purposes of identification in the event of death or injury arising out of an air attack. Any constable or authorized person is empowered to require production of the card on request.

The Forces. The conditions of service in the armed forces, the reserve and auxiliary forces are regulated by the following Acts which cover nearly every phase of service: *The Reserve and Auxiliary Forces Act 1939* which provides for calling up the reserves and for their reinstatement in civil life at the end of their service. *The Armed Forces (Conditions of Service) Act 1939* which *inter alia* provides for compulsory service overseas for the territorial army and the auxiliary air force. *The National Service (Armed Forces) Act 1939*, which took the place of the Military Training Act 1939, whereby in certain cases men up to the age of 41 are liable to be called up by royal proclamation, and which among many other things provides for conscientious objectors to military service.

Public Authorities and Local Government. The important part to be played by public authorities is set out in the

Civil Defence Act 1939, the Air Raid Precautions Act 1937 and the regulations made thereunder. The local authorities are made responsible for providing public air raid shelters and enforcing air raid precautions in all its branches. The schemes drawn up by the responsible officers of the local authorities have been put into operation, and vast sums of money have been and are still being spent on the provision and maintenance of an effective system of protection against enemy air raids. Fire brigades and the auxiliary air services, ambulances, stretcher-bearers, demolition squads, decontamination squads, first-aid posts—their establishment and maintenance are all carefully regulated, but the local authority is the responsible authority to which the government looks for the efficient and smooth working of the vast machinery of the Air Raid Precautions created by the Acts. Further powers are also given to local authorities under the *Housing (Emergency Provisions) Act 1939*, to enable them to repair any war damage to property, while under the *Essential Buildings and Plant (Repair of War) Damage Act 1939* provision is made for the repair of buildings, such as hospitals and schools, which are essential to the welfare of the civil population, and for the reinstatement of the plant of essential undertakings which have been damaged by war. The Housing (Emergency Provisions) Act 1939 generally enables the authorities to meet any emergency which may arise by extending the powers given to local authorities by the Housing Act 1936.

The above outline of the emergency legislation cannot, of course, do more than sketch the main features of the various Acts. It would have been tedious to repeat the words "*inter alia*," but these words must be frequently read into the article. It is, however, obvious that the emergency legislation has profoundly affected nearly every one in the realm and has, in effect, almost revolutionized national life. See also AIR RAID PRECAUTIONS; FOOD SUPPLIES IN WAR. (J. KE.)

EVACUATION. The precautionary evacuation of persons from regions exposed to hostile action is no novelty in war, but has become more important because of the new extension and intensity given to offence by aircraft. No part indeed of any belligerent country in Europe can be secure from attack, but certain areas can be distinguished as relatively secure and therefore a policy of transference and dispersal has been adopted by the countries at war and in danger of war. The term evacuation has been applied in the present connexion to this transference and dispersal of the civilian population.

Evacuation has been both compulsory and voluntary. In Great Britain, except in the case of civil servants, the evacuation has been wholly voluntary. The British evacuation scheme formulated by the ministry of health at the beginning of 1939 was at first intended to cover schoolchildren only. The country was therefore divided into three groups:

1. A limited number of large crowded areas from which evacuation was to take place, *i.e.* all metropolitan boroughs and most of the leading industrial, shipping, and naval centres, as well as more populous towns and boroughs in Essex and Middlesex.
2. A number of areas which, though not themselves to be evacuated, were not to be used for reception areas and were described as neutral areas.
3. Areas not to be included in (1) and (2) to be reception areas.

In these reception areas the local authorities were requested to undertake a survey of the accommodation



Keystone]

TWO HUNDRED CHILDREN WENT INTO RESIDENCE IN NOVEMBER
AT THE NATIONAL CAMP IN THE HOME COUNTIES

available for billeting in private houses and report by the end of January. It was decided that the main billets must be found in buildings regularly lived in rather than in empty property or camps. Experience of the holiday camps temporarily used by refugee children proved that they were quite unsuitable in rough weather. However, as a supplement to the scheme, a Camps Act was passed providing for fifty permanent camps to be built through the agency of non-profit-making companies known as the National Camps Corporation Ltd., each having accommodation for about 350 persons. Six of these camps were ready for occupation in Jan. 1940.

Following upon the children's evacuation scheme it was decided to include mothers with children under school age, expectant mothers, old persons, cripples, etc., in the scheme. The policy was not to empty the big cities, but to remove that portion of the population which was not necessary to the industrial and functional life of the cities. The billeting allowance to householders was fixed at 10s. for the first child and 8s. 6d. for subsequent children. After the outbreak of war, this was raised to 10s. 6d. for boys of sixteen years and over. The allowance for adults providing their own food was 5s. After evacuation had taken place the weekly expenditure on the children's account was estimated at £450,000, or 9s. per head, and from Oct. 28 a standard charge of 6s. a week was fixed for the parents' contribution, although those who could afford to do so were expected to pay the full 9s., and those who could not pay 6s. to pay less, the local authorities assessing and recovering payments.

With regard to the hospitals, it was decided that in case of war they would take both service and civilian casualties. There are in normal times about 500,000 hospital beds (including 150,000 in mental hospitals) in the country. It was reckoned that 112,000 could be freed at once by sending home patients and another 115,000 added; therefore, 250,000 beds could be made available for casualties within a short time of emergency conditions arising, and of these 200,000 would be ready within 24 hours. These arrangements were successfully accomplished in the days immediately preceding the outbreak of war. The medical schools attached to the hospitals were closed and the students were drafted to various provincial clinical centres.

In the case of the evacuation of business houses from the central part of London, the government advised the firms

concerned to move to neutral areas, but could offer no assistance. Firms, however, were naturally anxious to keep as near London as possible, and although some sought accommodation in the western half of the country, a good many endeavoured to establish their headquarters within fifty miles of London. With regard to civil servants, the government decided to transfer from London a limited number of departmental staffs who could perform their duties away from the centre without loss of efficiency. A billeting allowance of 21s. a week was granted. Actually, of the 80,000 civil servants working in London, only 16,000 were transferred during the first three months of war. A further 5,000 left in Jan. 1940. In order to house the staffs thus evacuated, the government, previous to the outbreak of war, provisionally commandeered a great many hotels and school buildings in various parts of the country. Practically the whole of London University was evacuated in September and its students scattered over various parts of the United Kingdom in co-operation with other universities.

Evacuation under the government scheme began on Friday, Sept. 1, and by the evening of the first day over half a million children and teachers had been moved from the congested and industrial areas in England and Scotland. By the following week, over 1,500,000 adults and children had been transferred to the reception areas. Owing, however, to the absence of air-raids and the dissatisfaction of the town-bred mothers with the phenomena of country life, a considerable number soon returned with their children to the cities. A further attempt was then made to evacuate children between two and five years by billeting them without their mothers, mainly in large houses, under the care of nurses and welfare workers.

It was estimated that 750,000 children were eventually billeted under the government scheme instead of the three million hoped for. As the return of those evacuated became the subject of much public and press comment, the minister of health asked the local authorities of the reception areas to take a census of those who had returned. The figures were not as high as expected. Out of the 1,500,000 moved, 50 per cent of the mothers and over 78 per cent of the children remained in the reception areas. There had been no outbreak of epidemics. Twelve thousand expectant mothers had been transferred and there had been 3,000 births in the first two months, with no increase in puerperal fever. A domiciliary medical service had been arranged for the children at the cost of £250,000 a year. However, the fact remained that a great many children never left the cities at all, and for this reason it was decided that the government's educational arrangements under the original scheme required modification. These had entailed the moving of each school as a unit with its teachers and the consequent closing of that school in the evacuation area. Schools in neutral areas had also been closed. Gradually this state of affairs was remedied and as many schools as possible were re-opened in the New Year. Many of the schools had been requisitioned for other purposes, and their release had to be effected and adequate air-raid protection built.

A return of business houses also took place towards the end of the year. About one-sixth of the firms which left London returned, but the larger concerns remained away. As a direct consequence, there was a considerable slowing down of all business operations.

France. In France voluntary evacuation from Paris followed much the same lines as from London. The

government requested all those who could, and were not needed, to take refuge in the country, and officially sponsored the removal of the schoolchildren. According to the returns made by the mayors and communes, over 2,500,000 persons left Paris and the suburbs at the beginning of the war. But the same causes that operated in England—absence of air-raids and dislike of country life—soon brought back a large proportion of this number. It was estimated that not more than a third of the population remained away. Contrary to the generally accepted view, a great many of the industrialized workers in Paris have no roots in the country. As in London, it became necessary to re-open the schools for the children who had remained or returned—about 10,000 out of a normal school population of 50,000. Two hundred and ten municipal schools were re-opened on Nov. 6, the distribution of the children being strictly governed by the air-raid shelter available.

In the eastern frontier region, evacuation was not primarily due to fear of air-raids. Here, on the first day of mobilization, the military authorities, according to a pre-arranged plan, ordered the complete evacuation of the civilian population of the towns and villages on the Rhine to a depth of five kilometres; Strasbourg, with a normal population of 200,000, being completely emptied. Later, the evacuation of the whole army zone, comprising the departments of Haut-Rhin, Bas-Rhin, and Moselle, was ordered. But, owing to the continued quiet on the Rhine front, the military authorities deferred the plans for the removal of the civilian population of Mulhouse and Colmar. Many of the inhabitants who had evacuated voluntarily at the outbreak of war returned later, and the schools, as in Paris, were re-opened on Nov. 6.

The transference of 650,000 inhabitants from the three departments of Alsace Lorraine was accomplished within the first week of the war. They were mainly accommodated in the towns and villages of the centre and south-west. The town of Perigueux received 150,000, five times its normal population. The policy of the government was to maintain the same regime in the reception areas as in the evacuation areas. M. Chautemps, vice-president of the council, was charged with the affairs of Alsace and Lorraine, and a consultative committee was appointed to consider all questions relative to the welfare of the transferred population. Twenty-one medical centres were established as well as work bureaux for men not in the army. The refugees were at first housed in wooden shelters, but later barracks were built. Efforts to ameliorate their lot were made by many charitable organizations, including a committee of American and British women resident in Paris, who sent a delegation to study conditions on the spot. The university of Strasbourg was re-opened at Clermont-Ferrand, except for the educational departments, which were established at Perigueux.

Germany. Information with regard to evacuation in Germany is necessarily slight, but there is no evidence that evacuation took place on account of the possibility of air-raids. The civilian population of Keitum, Mammarsch, and Westerland on the island of Sylt was transferred to S.W. Schleswig on Sept. 10, and the Rhine army zone would appear to have been cleared of the civilian population as on the French side. It was learned from a Roman source that the entire population of 130,000 of Saarbruecken was evacuated in twenty-four hours. According to the *Frankfurter Zeitung*, Saarbruecken-Stadt, Saarbruecken-land, Ottweiler, St. Ingbert, Homburg, Zweibruecken, Bergzabern, Pirmasens, and Gemersheim

were all forbidden to the civilian population without special permits. From a further source, it is understood that the civilian population was also evacuated from Karlsruhe, and from many places in Baden near the Rhine all those who were not sufficiently able-bodied to move at a moment's notice were evacuated to the east, some going to Wurtemberg and others to villages on Lake Constance. The official term for the evacuated parts of Western Germany is *Freimachungsgebiet West* = cleared western area. At Aachen, the remains of Charlemagne were removed, probably for the first time in history, and taken to the interior. Other treasures from the cathedral were also removed, but there was no general evacuation from the town. Many of the art treasures in Berlin were distributed in other parts of Germany. Both the French and German authorities introduced capital punishment as a penalty for looting.

Holland. In Holland preparations for evacuation from the main flood areas were made in November by the military authorities, but only a few villages were actually evacuated.

Finland. In Finland, before the outbreak of hostilities with Russia, only the voluntary evacuation of civilians from Helsinki and the other cities had taken place and many returned in November after the first tension was over. With the outbreak of war the population of Helsinki was reduced from 200,000 to 50,000. In Jan. 1940, although the enemy occupied only a relatively small part of the country, one-tenth of the population were refugees. All the schools were closed and education was at a complete standstill. It was estimated that 400,000 people had been evacuated and quartered largely in farmhouses and partly in public buildings.

Sweden. In Sweden plans for the evacuation of children between the ages of nine and fourteen from Stockholm, in case of emergency, had been prepared by the government by the end of 1939. (D. H.)

FOOD SUPPLIES IN WAR. In peace time Britain imports just two-thirds of her food requirements. This high degree of dependence on external sources of supply, higher than in any other country, naturally creates serious problems in time of war. How far do the normal sources of supply remain open? Can the shipping be found to transport the food? If not, how much more can be produced at home?

Great Britain entered the present war in a more favourable position as regards food than in 1914. She has rather more cattle, 50 per cent more pigs, and twice as many poultry. She has the same amount of wheat, and an entirely new crop, sugar beet, which furnishes a quarter of all her sugar requirements. One disadvantage from a war point of view is the loss since 1914 of over 2 million acres of arable land. Less fodder cereals and fodder roots are being grown, so that she depends more than formerly on imported feedingstuffs. Nevertheless, as regards imports the situation is relatively favourable. Whereas in 1914 considerable quantities of wheat and barley came from Russia and the Danubian countries, now almost all comes from North and South America and Australia, countries with which it is easier for Britain to keep open communications. Then the bulk of her sugar came from Germany and Austria; now almost all comes from non-European countries.

Furthermore, Britain undoubtedly entered the war in Sept. 1939 with substantial stocks of certain staple commodities. The policy of food storage had been in the forefront of public discussion for the previous two years and



[Keystone]

EMPLOYEES OF THE TOTTENHAM BOROUGH CLEANSING DEPOT, WHO HAVE FORMED THE FIRST PIG CLUB OF THE WAR, INSPECTING THEIR PIGS

had received the support of several eminent economists. In the spring of 1939 the British government bought large quantities of wheat, sugar, and oils, though this may have been partly offset by private traders reducing their holdings. However, the trade statistics to the end of Aug. 1939 show notably larger imports of these commodities and of eggs than in the same period of 1937 and 1938.

The outbreak of war had an immediate effect on Britain's foreign trade. According to *The Times*, exports during the first two months of war fell by 42 per cent and imports by 27 per cent—food imports by as much as 32 per cent. The fall in imports was only to an insignificant extent due to ships being torpedoed or mined; it was principally because the available shipping was required for the transport of troops, munitions, and materials necessary to the conduct of the war. In the case of some foodstuffs, however, Britain was completely cut off from certain previous sources of supply. Some 15 per cent of her butter came from Sweden, Finland, and the Baltic States, now closed to her. The bulk of her eggs and bacon came from Denmark and the Netherlands, and though both countries continued to export after the war started, several cargoes were lost or captured, and deliveries to British ports were far less regular than usual. At the time of writing it seems unlikely that the menace of submarines or mines will cause grave anxiety; on the other hand, the experience of the last war makes it certain that the demands of troops and raw materials on shipping space will become increasingly great. For this reason alone, apart altogether from the difficulty of maintaining exports wherewith to pay for her requirements, it will be imperative for Great Britain to economize on imports of food and feedingstuffs, particularly of the bulkier commodities.

This leads us to a consideration of the measures taken to meet the problem of increasing production at home. Whereas in the previous war far-reaching efforts were not made to increase cropping until 1917, and these did not have their full effect till the crop of 1918, this time a plough-up policy had already been initiated before the war began. Early in 1939 the government announced a subsidy of £2 per acre for the ploughing up of fields which had been at least seven years under grass. When war broke out this plan was enlarged to a programme of ploughing up 1½ million acres, equivalent to 10 per cent of the grassland of England and Wales.

Each county was allotted a certain quota based largely on the acreage which had gone out of cultivation during the past thirty years, and the county war agricultural committees were instructed to divide this out among district committees which were to persuade their farmers to plough the requisite acreage. Judging from the progress made during the autumn it was confidently expected that the 1½ million acres would be ploughed up by the spring of 1940. Ploughing up has, of course, its critics, who urge that to tear up good pasture to produce indifferent corn crops is diminishing, not increasing, the productivity of the land. But since it has been shown that with normal yields arable land produces some four times as much food (reckoned in calories) per acre as grassland,¹ the crop must be a very poor one indeed before the advantages of ploughing are offset.

The ploughing-up subsidy was reinforced by an advance in the guaranteed price for the 1940 cereal crop. Wheat was advanced from 45s. to 49s. 6d. per quarter; the guaranteed price of barley remained at 10s. per cwt., but all growers could henceforth claim subsidy, whereas in 1938 only those not claiming under the Wheat Act might benefit. Oats were guaranteed at 27s. per quarter. This is in marked contrast to the 1917-18 position. The Corn Production Act of 1917 introduced guaranteed minimum prices, but they were always substantially below the prices prevailing in the market.

It will be seen that British farmers have been given substantial inducement to grow more crops. But this in itself is not enough. In the last war the food production campaign was severely curtailed by the difficulties in getting enough men, horses, and machines. The Food Production Department struggled constantly with the War Office for the liberation of men for farm work, and with the ministry of munitions to obtain tractors and steam tackle for ploughing. It is true that in this war Britain has conscription from the beginning and that agriculture is a reserved occupation. It is true that there are 60,000 tractors on British farms which can accomplish ploughing far more rapidly than steam tackle or horses. But the drain on man power has not yet made itself felt; there is no shortage yet of machinery, repair parts, and mechanics. If the war lasts for anything like as long, or imposes anything like a similar strain on Britain's resources as the war of 1914-18, then it may ultimately prove almost impossible, merely for lack of men and power, to increase, perhaps even to maintain, the arable acreage. Already for the 1939 harvest there was a mild labour shortage. The county councils released men from road work and from drainage schemes to help on the farms, several thousand soldiers were made available, and, in addition, there was in process of formation the Women's Land Army, which by November was 25,000 strong, with 2,000 already working on farms.

A further difficulty may be experienced in regard to fertilizers. Britain imported large quantities of rock phosphates, principally from North Africa; there may not be ships enough to bring it. Also much of the nitrate of soda normally used on the land is in war-time required for the manufacture of explosives. In the last war the fertility of the land suffered greatly, in part owing to shortage of fertilizer and in part to excessive cropping with wheat.

In regard to livestock, Britain is, as already mentioned, better off than last time. But the very fact of having

¹ Sir Thomas Middleton: *Food Production in War*. Oxford, Humphrey Milford, 1923.

more animals means that she needs to import more feeding-stuffs. In 1914-18, although the cattle population remained stable, the milk output fell 20 per cent, mainly because of the lack of imported feeds—cereals and oil-cake. The pig population fell 20 per cent, also mainly for lack of feed. This time the minister of agriculture announced that the dairy herd would have priority in respect of feedingstuffs, and for cows there would be no shortage. But pig and poultry keepers have been told to reckon with one-third less bought feed. To some extent this may be offset by using more garbage and kitchen refuse, but a certain decline in numbers will be inevitable. Indeed, pigs and poultry are the most costly kinds of livestock to keep in war-time. They live almost entirely on imported feeds; together they consume well over half the total feedingstuffs imports. To compensate for this reduction the government are urging an expansion of the sheep population, firstly because the sheep is an animal which reaches maturity comparatively quickly, and secondly because sheep feed almost solely on home-grown grass and, moreover, mostly on the poorer mountain grass. Attractive prices have been fixed as from Jan. 1940: 12d. per lb. for fat sheep and 13d. for fat lambs. A move has further been made to encourage pig clubs and pig-keeping in back gardens, since pigs reared in this way are mainly fed on waste and refuse. By the end of the last war pig clubs were producing meat at the rate of five million tons per annum.

Meat supplies from abroad are being maintained. After a drop in imports during the first two months of the war, it was announced in parliament in December that they were again up to the pre-war level. But the needs of the fighting services come first, and actually home butchers were being issued only 50 per cent of their normal supplies of imported meat.

In view of the urgent need to economize feedingstuffs, it has been questioned how far any home-produced milk should in war-time be utilized in butter-making. It is pointed out that 10 lb. of concentrates are needed to produce 3 gallons of milk which makes 1 lb. of butter. Therefore, it would economize shipping space to import the butter rather than the feed.

The prices of all concentrates have been fixed by the government at levels slightly above those of Aug. 1939 but considerably below the average of 1938. Preliminary control of fat stock sales was tried out in the autumn, followed by de-control in December, before a scheme of complete control was launched in Jan. 1940, the government then being the sole buyer of all meat. The prices proposed for January, at the time of writing, are for fat cattle from 37s. to 55s. 6d. per live cwt. according to quality, and for pigs 15s. per score (deadweight). Milk prices to producers were improved firstly by an increase of 2½d. per gallon in November in the price of manufacturing milk, and secondly by a government subsidy of 3d. per gallon so as to avoid raising the price of liquid milk. Meantime, agricultural wages had in most counties by the end of 1939 been advanced 2s. or 2s. 6d. per week.

Another line of activity for developing food production is the allotments campaign. The allotments movement which boomed in the last war had sunk back to a modest level of activity. So many times allotment land had been taken for building, road widening, etc., that allotment holders had lost heart. But in the autumn of 1939, under the slogan "Dig for Victory", local authorities were urged to set about providing half a million new 10-rod allotment

plots. As yet there has been no great demand, but the public attitude may change if food in the shops becomes much dearer or if any shortage occurs.

In the sphere of price-fixing and in the control of distribution the machinery of organization is already more highly developed than ever it was in the last war. Already by the end of 1939 the government had become the sole importer of all the principal feedingstuffs and the sole buyer from the British farmer of most of his products. This should make it far easier to control prices and to regulate the distribution of supplies. For several important commodities maximum retail prices were introduced in the early weeks of the war, notably for butter, sugar, and tea. Local food committees were set up by every local authority to supervise supplies and prices. Each has fifteen members, including five representatives of the retail trades, the others, two of whom must be women, representing all classes of persons in the area. Nevertheless, it proved impossible to prevent a pronounced rise in the cost of living in the early period of the war. From 155 on Sept. 1 the index rose to 169 on Nov. 1, and is still rising.

In order to make possible the issue of ration cards a national registration was carried out on Sept. 29. Ration books were issued to all householders in November, but actually only "unofficial rationing" was practised before Christmas, and that only in respect of butter and sugar. At that time, according to an announcement in parliament, only 50 per cent of normal butter supplies were being issued, but considerable quantities were being put into store. From January onwards, however, official rationing came into force: butter, 4 oz. per head per week; bacon and ham 4 oz., increased to 8 oz. at the beginning of February; sugar 12 oz.

It is too early to make any forecast as to how the position regarding food supplies will develop. No one knows how long the war will last, what strain will be put upon Britain's shipping and foreign exchange reserve, and what the calls on her man power will be. There will certainly not be enough ships or money to obtain from abroad all the food, and more particularly all the feedingstuffs, which Britain normally imports. As for making this good by increased production at home, much is being done. An addition of 1½ million acres to the arable land means over one million tons more grain (or its equivalent in other crops), or one-tenth of her feedingstuffs imports. But to ploughing up a limit is set, partly by the acres available of sufficiently suitable land and partly by the number of men which can be spared for farming. A certain reduction on peacetime supplies there will inevitably be, but the government has an organization in being which should obviate the occurrence of food queues, so typical of the last war, and should ensure a more equitable distribution of supplies than on the former occasion. (P. L. Y.)

HOSPITALS. The outbreak of war inevitably affected seriously the usage and administration of British hospitals. It was necessary to make ample provision for all possible naval, military, and air casualties requiring institutional attention, and it was considered desirable, also, to provide accommodation for a very large number of possible casualties among civilians following upon air-raids. Very many beds were kept empty for these purposes, and medical and surgical staffs were mobilized on a whole-time basis, or on a part-time basis with liability at a moment's notice to be called up for whole-time service. In most cases, hospitals were arranged in groups so as to make their joint accommodation more fully and systematically

available for different classes of patients. Actually, at all events during the first three months of war, some of these precautions proved to be over elaborate. They resulted, in some institutions, in provision for ordinary civilian cases being unduly restricted, in a considerable amount of expensive provision lying idle for a long period and, for a while, in many members of the medical and surgical staffs being barred from attending their private practices and having no other patients for whom they were responsible. The effect of these circumstances and arrangements on the finances of the voluntary hospitals and their staffs is not yet ascertainable but must be serious; and, apart from finance, the emergency organization itself, though accepted as temporary, is not unlikely, in some directions, to affect the position and the staffing of voluntary hospitals in the post-war period and even permanently. The danger to the principles of voluntary management and of part-time or honorary staffing is not negligible.



Fox Photos]

RADIUM IS STORED 280 FEET BELOW THE SURFACE IN ANCIENT CAVERNS; EXPERTS DESCEND TO COLLECT RADON GAS

An important development due to the war has been the provision of what may be described as rail-transport hospitals, (a) for military casualties, and (b) for civilian casualties. For the former a number of trains have been thoroughly equipped as travelling hospitals. Each consists of nine coaches, four of which have been converted into wards, one of these for officers. There are 36 beds to each coach arranged in tiers of three. At the end of each coach there is a lavatory and cupboard accommodation and in the middle of each a drinking-water tank. The first coach of each train is reserved for the two medical officers and two nursing sisters; the second is for the twenty N.C.O.'s and men who act as orderlies and kitchen staff; the third coach is for kitchen and stores; and the fourth is a dispensary. Two small padded compartments on each

train are fitted for acute mental cases, should they be necessary. For civilian casualty evacuation there are 34 trains, each a quarter of a mile in length, consisting of nine converted fruit or milk vans. The stretchers are fixed to each wall in three tiers, each van taking thirty cases. Dressings, drugs, disinfectants, and medical comforts are provided and the crew of each train consists of one medical officer, one train officer, three sisters, and eight other nurses, and eight St. John Ambulance orderlies. The transformation of the train from its ordinary purpose into a thoroughly efficient casualty hospital is remarkable. It should be noted that the British Red Cross Society and the Order of St. John of Jerusalem have amalgamated for the duration of the war as they did in 1914.

The compulsory grouping of hospitals for emergency and war purposes is likely to accelerate progress towards that regionalization of hospitals regarded as vital by the voluntary hospitals commission. This movement has been disappointingly slow, though there is increasing co-operation in some directions and there have been a few actual amalgamations, as in Birmingham and Newcastle. The conversion of Poor Law hospitals into public hospitals and the improvement in equipment and staffing have continued. The provision of "pay-beds" in voluntary hospitals has also expanded. There are now more than 2,200 such beds in the 146 hospitals of the King Edward's Hospital Fund area. They show an average profit of some £34 a bed. An important event has been the publication of the third edition of Captain J. Stone's book *Hospital Administration and Management*. It is the most comprehensive and authoritative work on matters both of hospital policy and of technical details of construction and management; and is now thoroughly up to date.

An interim report has been issued by the inter-departmental committee on nursing. There has been much concern as to the supply of nurses and as to their conditions of work. It is estimated that 12,000 recruits are needed each year. The present deficiency is due not to any diminution in the number of entrants but to a rapidly increasing demand and to the fact that a large proportion—from 20 to 30 per cent—of those entering the profession do not continue beyond their first year of training. Important recommendations as to recruiting, training, status, and conditions of work are made, and some of these have already been put into effect in some hospitals.

In New Zealand the government named June 1 as the date for the coming into effect of the hospital provisions of the Social Security Act. In connexion with the hospitals of Brisbane it is noteworthy that the university of Queensland has now established a complete faculty of medicine and a full-time medical school. (H. BR.)

INDUSTRY, WAR CONTROL OF. This article deals with the organization and effects of governmental control of industry as exercised in time of war. So short a time has elapsed since the outbreak of war in Sept. 1939, that it has not been found possible to say much about the actual effects; problems rather than effects have been dealt with.

Organization. Already before the war the British government had taken measures of a preparatory nature, such as the accumulation of stocks of certain essential materials; the creation of "shadow" factories whose output could be greatly expanded if need arose; the formation of the ministry of supply, which came into legal existence on July 13, 1939; and the passing of the Emergency Powers (Defence) Act of Aug. 24, 1939.

With the outbreak of the war the ministry of supply put into full operation the powers it had been given for the organization of the output of munitions of all kinds for the army (the navy and the air force maintaining their separate supply organizations), and also took over control of the supply and allocation of raw materials for all the services. In this latter respect the procedure adopted was to constitute separate control boards for each of the important raw materials, the main function of the boards being to regulate prices and the distribution of supplies with priority for government and essential civil requirements. The chief directing personnel in the controls has been drawn from the trades in question, thus giving effect to the principle that, so far as possible, industry should control itself. The other side of the work of the ministry of supply—the stimulation of the output of munitions—made rapid progress during the first four months of the war. On Dec. 19, 1939, the minister announced that contracts to the value of £234,000,000 had been placed, while an elaborate system of cost accountancy and inspection of books had been instituted to ensure that the state was not paying excessive prices. The country has been divided into thirteen areas administered by regional commissioners, who are responsible for mobilizing all the local industrial resources available. By the latter part of Dec. 1939 the number of firms under contract to the ministry had in fact risen from 12,810, before the war, to 15,000.

In addition to the ministry of supply—the Board of Trade, the ministries of food, shipping, transport and economic warfare, the departments of mines and of overseas trade and the Treasury—all these have vast and important functions to carry out in wartime, many of which impinge directly or indirectly upon the conduct and well-being of industry. The last mentioned of these departments, the Treasury, is in a key position, through its control over expenditure involving the sale of foreign currencies, *i.e.* the finance of imports. But it also comes directly into contact with industry by virtue of its newly acquired power to license all new capital issues. An illustration of the changing conditions produced by war can be taken from the iron and steel industry: the import duties on foreign iron and steel were abolished on Dec. 5, 1939, and fourteen days later a licensing system was introduced for the import of iron and steel, as well as many of the raw materials required by the industry. Again, in agriculture, the marketing boards have been transformed from producer-controlled quasi-monopolies into government agencies for carrying out wartime control and distribution of supplies.

At the same time that domestic industries were being subjected to a network of controls, steps were taken to resuscitate and expand the inter-allied economic co-operation, which played so important a rôle in the last year of the Great War. On Nov. 17, 1939, it was decided to form six Anglo-French committees to take executive action in the whole range of buying whatever may be needed by the two countries, both for military and civilian purposes. The six committees deal with the following matters: aviation, munitions and raw materials, oil, food, shipping and economic warfare; and in all matters of supply the two countries have agreed to draw up their import programmes jointly. The degree of co-operation extends, however, much beyond a mere arrangement to avoid competitive buying; thus it involves the pooling of shipping facilities, and, by a later agreement in Dec. 1939, the pooling of the foreign assets of Britain and France. The Franco-British exchange has also been pegged for the duration of the war,



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ASSEMBLING WORLD'S FASTEST BOMBERS IN A FACTORY IN THE NORTH OF ENGLAND

for government purposes, at 176½ francs to the pound. It would be difficult to over-estimate the importance of these measures for the successful conduct of the war on its financial and economic side.

Effects. The main tasks of economic organization in wartime are firstly, to maximize the total output of the labour, capital and natural resources of the country and, secondly, to divert as much as possible of this output to essential war purposes. The latter task presents great difficulties, as it involves establishing an order of priority between the main competitors for output—the war services, exports, and the minimum needs of the civilian population. All of these are important, while, in the case of man power itself, there are the further claims of the fighting forces. It is impossible to carry out these tasks without a large measure of control over the economic system.

In the Great War economic controls were slow to establish themselves, and it was not until after the Germans had adopted unlimited submarine warfare in the spring of 1917, that the organization of the economic life of the country was undertaken on a comprehensive scale. By the end of the war, however, it had attained a high degree of development. In the present war, the aim has been to start off from approximately the stage of development attained at the end of the last war. At the same time, the air menace has led to the emergence of new problems which have given rise to the establishment of a great deal of administrative machinery, not all of which turned out to be immediately needed, while some of it involved financial waste and a serious interference with the other major tasks of wartime economy.

The immediate effects of the outbreak of the present war were to disorganize very seriously the exporting industries of the country and also a great deal of normal domestic trade, owing partly to the direct effects of a state of war, partly to evacuation (which hit London particularly hard) and partly to the new controls themselves. Many of the difficulties and embarrassments in the economic field during the first four months of the war, arose from two main factors. Firstly, the system of controls which had been worked out in 1918 was the outcome of the accumulated experience of four years of war, and those who were administering the controls had lived with and in the organization as it was developing. On the other hand, the present generation of civil servants had to cope, for the most part without previous experience, with a system of controls which had not been evolved organically, but had

sprung into life already fully mature—at least on paper. It will undoubtedly take time, and the making and correction of many mistakes, before the present organization can function really efficiently. Secondly, the appearance of administrative and economic chaos in the opening stages of the war was necessarily enhanced by the fact that enough time had not elapsed to allow the new purchasing power being created by the vast government expenditure to offset the decline in individual income occasioned by the initial impact of the war upon economic life. As soon as the combined effects of government expenditure and of the withdrawal of labour into military service have resulted in the full employment of the man-power and industrial resources of the country, it will be faced with scarcity on every hand and both the scope for, and the need of, organization will become very much greater.

It has been shown in the first section of this article that the wartime control of economic affairs is divided between a large number of separate ministries and government departments and, at the moment of writing, there is an evident lack of co-ordination between them. There is no central authority capable of imposing a common economic policy upon ministries, each of which is sovereign within its own sphere. At the same time, measures adopted by one ministry may have damaging effects upon the interests of others.

The war organization of economic effort is still in its very early stages, and, as yet, there is no indication that a solution has been found for three major problems, all of which are closely inter-connected—the problems of prices, wages, and the finance of the money cost of running the war.

(C. W. G.)

NATIONAL SERVICE. Of the many notable developments in the sphere of national service in the year 1939 the most significant was undoubtedly the passage into law during May of the Military Training Act. Although before this reached the statute book all military service in Great Britain in time of peace had, in modern times, been based on the voluntary principle, conscription had been imposed in the later stages of the Great War of 1914–18. The compulsory principle was also implicit in the militia which had been replaced by Haldane's Territorial Force, and the duty of the citizen to assist in the defence of the realm is an undoubted principle of the English common law. It is probable that to most Englishmen the passage into law of a measure compelling every young man of twenty years of age to undergo six months' military training marked not so much an important constitutional innovation, which it was, as the first step in the transition from a state of peace to a state of war.

Prior to this, the various branches of national service had expanded rapidly in the opening months of the year. A national service handbook was issued to all householders in January giving information as to the directions in which different persons' services could best be utilized according to their age, sex, and qualifications. Recruiting both for the fighting services and for civil defence went on steadily until the month of March, when the German government destroyed the Czech State in violation of its previous pledges to respect her independence. Shortly after this the British government gave guarantees to Poland, Rumania, and Greece, and to enable these to be implemented by military action it was decided to double the Territorial Army's field force so that the latter was now to comprise fourteen divisions. Scarcely had this decision been reached when the Military Training Bill was introduced. It was opposed

somewhat half-heartedly by the Labour party but, while some objections were raised to the compulsory principle, there was too large a measure of unanimity on behalf of the cause which the measure was intended to further for the opposition to it ever to reach serious proportions. The public was in a mood to demand strong measures and to accept sacrifices in order to carry them out.

At the same time as Britain's defences were being expanded both by legislative enactment and by voluntary effort, the government showed its determination to avoid the repetition, if a state of emergency should arise, of one of the most serious mistakes of 1914. A list of reserved occupations was prepared, designed to ensure that men engaged in industrial or other work, which by reason of its nature was vital to the maintenance of the national effort in the event of war, should not leave their posts: men in such occupations of over a specified age, which varied in each case, could not be enrolled in the armed forces or given a full-time post in any civil defence organization. This list has since been altered from time to time.

On the eve of the outbreak of war between Great Britain and Germany, the National Service (Armed Forces) Bill was passed into law. This made all male British subjects between the ages of 18 and 41, except ministers of recognized religious creeds, liable to military service: the minister of labour had, as before, the right to classify as reserved any occupation which he thought proper, and men in such occupations could, at first, be neither conscripted nor, if volunteers, accepted. At the beginning of 1940, however, the minister ruled that men in certain reserved occupations should be accepted as volunteers. By the end of 1939, the age-groups between 20 and 23 had been ordered to register, and at the beginning of 1940 authority was given to call up the age-groups between 19 and 28 without the formality of a royal proclamation. Meanwhile numerous volunteers, both for the fighting services and for civil defence, have enrolled themselves and been accepted for service since the beginning of the war.

(W. T. WE.)

WAR AND PEACE AIMS. What is the distinction, when a nation is engaged in war, between its war aims and its peace aims? Broadly speaking, one may say that the war aims of a nation consist in the end which it sets before itself, or, in other words, in the limit to which it proposes to go, in reducing the military forces of the enemy nation. But since it takes two to play at the game of war, and since either side will have its separate idea of the end or limit to be attained in the conduct of hostilities, it is obvious that the war aims of one side will be affected by those of the other, and that an extension on the one side will tend to be followed by an extension on the other. In this sense the end or limit cannot be said to be fixed: it moves with the movement of the dynamic process of interaction which is set in motion by war. The peace aims of a nation may also similarly move during the process of war. They always relate to three main things, and they always consist in the end or limit proposed for dealing with these three things: first, the method of the negotiation of peace (that is to say, whether the treaty of peace should be unilaterally imposed, or bilaterally agreed, or multilaterally determined); secondly, the settlement of the detailed terms of peace, especially in regard to frontiers; and lastly, the fixing of the general scheme or system of relations which is to be maintained after peace has been negotiated and its detailed terms have been settled. But while peace aims always relate to these three main things,

and are in that sense constant, they will also vary and move with the actual course of hostilities. The war may extend or alter its scope ; and that will extend or alter the general scope of the peace which follows the war. We can only speak of war and peace aims, as they stand at the beginning of 1940, in terms of the general conjuncture of events, and the general state of feeling at that precise moment of time. On the other hand if the nation is convinced that the ideas of war and peace with which it has begun the war are valuable in themselves, and ought to be steadfastly followed to the utmost possible extent through all conjunctures and contingencies, there may be a steady certainty of purpose even among the uncertainties of war.

War Aims. The war aim of Great Britain and France is not only, or simply, the defeat of the military, naval, and air forces of Germany by such methods of warfare (and among them the economic method) as we have at our command. It is also, as the prime minister stated in his broadcast speech of Nov. 26, the defeat of a mentality—a mentality which sees in reasons of state a justification for the use of force to dominate other peoples, for the practice of persecution on inoffensive citizens, and for the repudiation of pledges and pacts whenever they are found inconvenient. A war aim which includes the defeat of a mentality may seem, at first sight, to be a vastly extended war aim. It may seem to involve a fight against the spirit and the genius of a people. The opposite is really the case. We restrict and define our war aims when we include among them the defeat of a mentality. We restrict and define them for the simple reason that this mentality is not, in our view, the mentality of a whole people. It is the mentality of a section which has seized the command of a whole people, and controls and employs against us a whole people's military resources. So long as that section has the control, we must employ against those resources the whole of our resources. But our ultimate war aim consists in breaking the power of that section, and not in breaking the people, or the spirit and genius of the people, which is commanded, for the time being, by that section. If we are told, and if it is proved, that there is not and cannot be any division—that the section is the people, and the people is the section—we shall have to alter our war aims. But as they stand to-day, they are in no way directed to the breaking of the people. They are directed to the breaking of the military resources of a people because those resources are commanded, and so long as they are commanded, by a section which is permeated by a particular and intolerable mentality ; and they are so directed because the real thing which we wish to break is that mentality. In the speech which has already been mentioned the prime minister, after declaring that it was the British war aim to defeat a mentality or a spirit, added some explanatory words which deserve to be quoted in full : " If the German people can be convinced that that spirit is as bad for themselves as for the rest of the world, they will abandon it. If we can secure that they do abandon it without bloodshed, so much the better ; but abandoned it must be."

It follows that our war aim does not involve the breaking of Germany—unless Germany has to be broken in order to break a mentality. A war aim which can conceivably be satisfied " without bloodshed " is not a war aim which implies that result. If an authority arose in Germany which disavowed the mentality and the methods of the last seven years, our war aim might be achieved without any further prosecution of war. Whether there is any

chance of the rise of such an authority is an issue which depends on the balance of forces and wills in Germany. But in any case there is one thing to be said about the character of this war which has a vital bearing on our immediate war aims, and which may vitally affect our ultimate peace aims. It is not clear (indeed it is far from clear) that we are engaged in what may be called a " national " war—that is to say, a war in which the nation of Germany is confronted by the nations of France and Britain. On the contrary, it may be held that we are engaged in something which is of the nature of a " civil " war—that is to say, a war in which one set of ideas about the proper system and constitution of Central and Western Europe is pitted against another set of ideas. In that sense we are engaged in a war of ideologies. If we are so engaged, we have to defeat the ideology opposed to our own. But there is this difference between the ideology which we defend and the ideology which we challenge. France and Britain are united to a man in support of the ideology which they defend. It is still obscure whether there is any such union on the other side. If there is, the war will become a " national " war, and the war aim will become that of a national war. If there is not, there will remain, at any rate on one of the two sides, the element of " civil " war, and the war aim will remain affected by that fact. That is why, at the beginning of 1940, there is still some obscurity about war aims. It is also perhaps the reason why the war, in its initial phase, seems to us to have followed a curious and even paradoxical course.

There are other riddles besides the riddle of the character of the war. There is the riddle of the possible extension of the war. An extension of the war might also extend, or at any rate modify, the nature of our war aims. Russia stands as a question mark, both in regard to the foreign policy which she intends, or may be led, to pursue, and in regard to her own internal stability. There may be further movements beyond the movement which has plunged her among the snows and ice of Finland. There may also be internal cracks which will have external reverberations. Italy meanwhile stands in a prepared state of non-belligerency. There has seldom been a new year of which it was less possible to foresee the end. 'All that can safely be said is that war is a fire which is apt to spread. But perhaps, to-day, a contrary thing can also safely be said. The aversion of the masses in all countries from war is greater than it has ever been. A new factor in Europe, which may be of vast importance for its future—a factor which vividly appeared, like a flash of lightning, at the end of Sept. 1938—is the popular passion for peace and the popular feeling for the peace-maker. The tendency of the fire of war to spread may be met and turned back by a new tendency of general feeling among the masses. That would affect, and very vitally affect, the war aims of statesmen and governments. And it would affect them in all countries alike.

Peace Aims. In turning from war aims to peace aims we enter the more congenial field of construction. It is, however, a misty field. The temper in which we shall find ourselves at the end of the war will largely determine our construction. But we do not know what it will be : we only know the temper in which we find ourselves now. Similarly the materials with which we have to build will largely determine what we build. But we only know the materials which lie to our hands at present : we do not know what they will be in the peace year.

(a) So far as the method of negotiating peace is concerned

—and that question of method and procedure is the first question which arises—our present temper, based on the experience of the last twenty years, is a temper averse from any idea of an imposed or dictated peace, even in the event of an absolute victory. An imposed peace might be just and right in its actual provisions: we feel that it would be none the less wrong—and fundamentally wrong—in the method of its making. France and Britain, in their own internal systems, stand for the method of free discussion, which is the essential method of democracy. They will naturally and logically carry that method into the negotiation of peace; but they will also naturally and logically claim, if they are the victorious side, and if they are thus “in a majority”, that the other side should do its homage to the majority-principle, and should recognize that, if there is to be give and take, it will have to do a good deal of the giving. But the general principle of the allied cause will involve something more than the inclusion of Germany as a partner in the negotiation of peace. It will involve the inclusion of other states which are not now belligerent, and may never be belligerent during the course of the war. “What touches all should be approved by all.” All who are touched and concerned by the terms of peace should be drawn into the negotiation of peace. Non-belligerent powers—including (it is conceivable) powers which have no “temporal” power—may aid and strengthen counsel. No aid which would help to secure a genuine and lasting agreement can be refused.

(b) Perhaps the detailed terms of peace are a matter of less fundamental importance than the method (which also involves the spirit) of the negotiation of peace. But there are matters which belong to the sphere of detailed terms that are cardinal—so cardinal that, whatever the method and the spirit of negotiation, they must be secured in any treaty of settlement. Foremost among them is the matter of the restoration of national liberty wherever it has been destroyed or diminished to a shadow. “We desire”, as the foreign secretary stated in a speech of Dec. 5, 1939, “that peoples that have been deprived of their independence should recover their liberties.” In the same sense Pius XII, speaking on Christmas Eve, laid down as the first postulate for a just and honourable peace that all nations, great and small, strong and weak, have a right to life and independence, and that when this equality of rights has been destroyed or damaged or imperilled, the juridical order calls for reparation based on justice.

The general principle is clear. It involves the restoration of the liberties of the Polish and Czech peoples: it involves the free determination by Austria of her own future. But the details of the application of the general principle must be left to negotiation, and the give and take of negotiation; and they must involve that element of compromise and that attempt to find a *via media* which is inherent in negotiation. The Poland to be restored is not necessarily Poland as it stood on Aug. 31, 1939. The old boundaries will have to be redrawn—here, it may be extended, and there, again, retrenched. Whether a plebiscite should be taken and, if so, in what areas and under what auspices, will be a matter to be settled in the negotiations which precede the treaty. The essential thing is that the Polish people should recover its liberties: the thing which is open to negotiation is the demarcation of the frontiers of the Polish State, whether that demarcation is wholly settled in the treaty itself or is partly left to be settled subsequently by the method of plebiscite. The same may be said of the restoration of the liberties of the Czech people. They

are themselves a fixed quantity, which stands beyond negotiation and compromise. But whether there should be again a state which is called Czecho-Slovak, or whether the new state should be Czech and what, in either event, should be its boundaries, are questions which can be assigned to the area of discussion.

The future of Austria raises questions somewhat different from those raised by the future of the Polish and Czech peoples. It is not clear that Austria is the home of a separate people in the same sort of sense as Poland and Bohemia are the homes of separate peoples. What is clear is that the inhabitants of Austria should be given the right of declaring, freely and independently, what it is that they want to be—what sort of state they wish to form, or into what sort of state they desire to enter and upon what conditions. It cannot be justly said that their case has hitherto been treated on its own merits. It has been treated almost exclusively not in itself, but in relation to the general balance and system of Europe. No state can be considered without some regard to that system; but it has been the misfortune of Austria that she has been considered, from one side and the other, with an almost total regard to factors outside herself. In the making of a new treaty that error should be corrected, and Austria should have the liberty of declaring for herself, what it is that she herself desires.

These are some of the main matters which belong to the sphere of the detailed terms of peace. They are not likely to be the only matters; but, at the present time, they are what we regard as the crucial matters. For ourselves, and for our ally, there is no question of territorial aggrandizement. For Germany, so far as we are concerned, there is no question of territorial diminution, except such as is involved in the recovery of their liberties by peoples which have been temporarily brought under the domination of Germany. Whether the colonial question, and especially the question of African colonies, is likely to be raised in the negotiation of peace is an issue which depends on the arbitrament of the future. It has not hitherto been directly raised. No statement of peace aims has hitherto included any specific objects in this field. The general question *may* be raised at the council table round which the terms of peace are negotiated. If it is raised, its solution will depend on other and larger issues. It will depend on whether a new Germany has arisen, and whether that new Germany is included in some new system of Europe.

(c) Here we come to the third main problem involved in any attempt to state peace aims. Over and above the problem of the method of negotiating peace, and over and above the problem of the detailed terms of peace, there is the problem of the fixing of the general scheme or system of relations which is to be maintained after peace has been negotiated and its detailed terms have been settled. The three problems are of course interwoven. The method of negotiating peace, and the detailed terms of peace, will affect, as they will also be affected by, the general scheme or system of relations which statesmen propose to fix. It is only in an analysis that the problems can be separated.

Federalism. The general movement of thought, in regard to a new scheme or system of relations between the states of Europe, has lately been moving in a direction which may be called federal. M. Daladier, in a speech delivered before the French Senate on Dec. 29, 1939, referred to a possible federal organization in the future between European states. British statesmen have not yet made so specific a reference. But the British prime

minister, in his broadcast speech of Nov. 26, went a considerable distance in the same direction. He did not speak of a federal European organization. But he defined the main British peace aim as being the establishment of "a new Europe." In that new Europe, he said, thinking immediately of the terms of the peace to be made at the end of the war, "such adjustments of boundaries as would be necessary would be thrashed out between neighbours sitting on equal terms around a table with the help of disinterested third parties if it were so desired." In that new Europe, he added, looking farther into the future, there must for the sake of lasting peace be a full and constant flow of trade between the nations concerned; in it, each nation must choose its own form of internal government: in it, armaments would be gradually dropped, except in so far as they were needed for internal order. He went still farther. He argued that the establishment of such a new Europe would be a continuous process stretching over many years, and would need some organs capable of conducting its development. He did not specify the machinery which would be necessary, nor did he use the word federal; but he concluded by expressing his hope that a new Germany, animated by a new spirit, might take part in the operations of such machinery.

The door stands open for a policy of the gradual introduction of some federal organization in Europe—the policy sketched by Briand before the Assembly of the League of Nations in Sept. 1929. The door was not closed, though a just caution was expressed, in the speech which the foreign secretary, Lord Halifax, made in the House of Lords on Dec. 5. Any federal organization, however tentative, will obviously require some measure of resignation of national sovereignty—some writing of a minus against the plenitude of such sovereignty. Lord Halifax spoke of the idea that nations should surrender in some measure their national rights in order to clear the way for a more organic unit. He said that he did not know that he would go quite so far. He urged the view that no paper plans would endure which did not freely spring from the will of peoples. He argued that it was the economic side of international collaboration which needed emphasis and thought; but he also admitted that, from working together on concrete problems in finance and trade, closer political understanding might spring and develop.

Here there arises an issue which arose, in much the same form, when Briand sketched his policy ten years ago. Should the union of Europe proceed on economic lines, and take the form of a European Customs Union, as the followers of Stresemann were inclined to believe? Or should economic considerations be subordinated to politics, as Briand believed, and should some form of political union first be attempted? Perhaps the divergence is not as great as it may *prima facie* appear. Any union of Europe which may follow the war, and be attempted (at any rate in some tentative form) during the negotiation of peace, will have been preceded, and indeed is already being actually preceded, by measures of union—measures of a federal character—which have been adopted in connexion with the prosecution of war. War measures may bear peace fruits. In the war measures already adopted in the interests of union, there has been no divergence of opinion about the priority of economic or political measures. Indeed there has been no question of priority: both sets of measures have been adopted simultaneously. We may notice three sets of measures which have been adopted. The first has been the establishment, by France and Great

Britain, of a common foreign policy. The second has been the establishment of a Supreme War Council, representing both countries, to direct the military forces of both. The third has been the establishment of an Anglo-French co-ordinating committee to gather together the financial and economic resources of both countries. These measures, touching as they do the three matters which lie at the root of any federal system, constitute the germs of a nascent federation. They are measures which are at once political and economic. If they are confined, for the time being, to France and Great Britain, that is the result of the immediate exigencies of war. They have the potentialities of something more. They can develop into a magnet around which other countries may cluster.

In any case the federal idea is entering, in one form or another, into the peace aims of France and Britain: indeed it has even entered (perhaps by imitation) into statements of German peace aims. But the idea of federalism is not the only general idea which bears on the fixing of the scheme or system of relations in the new Europe which has to be constituted at the end of the war. Perhaps, indeed, it has the merit of being able to include, or carry, other ideas which, it is generally felt, must also enter into the fixing of that scheme—ideas such as disarmament, or again the reduction of economic barriers and a movement towards the freedom of European trade. But some of these other ideas have such importance that they must also be considered in themselves.

Other Considerations. Disarmament comes first among these ideas. The gradual dropping of armaments, except in so far as they are needed for internal order, has been declared by Mr. Chamberlain to be a cardinal article of a new European system. It was equally emphasized, as the second of his postulates for peace, by Pius XII in his address of Christmas Eve. The words which he used have been echoed by general opinion on the French and British side. He spoke of the danger that material forces may become not the defender, but the tyrannical violator, of right: he urged that peace must be founded upon disarmament, mutually accepted, organic and progressive, both in the practical and the spiritual order of things.

A second idea concerns the provision of machinery both for the just interpretation and for the equitable revision of treaties, and especially of the treaty which must be concluded at the end of the present war. A fixed treaty system, as we have learned from the experience of the last twenty years, does not remain fixed. It only leads, if there is no adequate machinery for revision as well as for interpretation, to unilateral infringements. Here is matter for the reform of the League of Nations (which a federal organization between states in Europe would make no less necessary, but perhaps even more necessary)—for the strengthening of the Permanent Court of International Justice, and for the institution of a new "equity" court which would be competent to consider requests for the revision of treaty arrangements. Here, too, enters the third of Pius XII's postulates for peace—"the constitution of juridical institutions which may seem to ensure the loyal and faithful application of agreements, and, when the need is recognized, to revise and correct them."

A third idea concerns the proper protection of minorities, ethnical or religious, and particularly of the great international minority of the Jews. That protection is a general problem; but obviously it is a problem nowhere more urgent than it is in regard to the Jews. Minorities are bound to appear before the council table round which the



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A NATIONAL SAVINGS SHOP HAS BEEN OPENED AT MARGATE; THE MAYOR IS SEEN SELLING SAVINGS CERTIFICATES

new treaty will be made: in particular, we may expect the Jews of Europe (and not only of Europe) to put their case. Our peace aims are bound to include some new attempt in the settlement of the problem of minorities. Covered by the dust of war ourselves, we cannot yet clearly see all that is emerging. But we can accept, even if we have not yet stated, the fourth of the Pope's postulates for peace—that "attention must be paid to the true needs and just demands of the nations and peoples, and of the ethnical minorities", and that these demands must receive our friendly examination, so that they may be met in a peaceful manner.

This is where, so far as it is possible to see, we stand at the beginning of 1940. But the year has its movements to come and its new lessons to teach. (E. BA.)

WAR FINANCE. Governments in war have to spend large amounts of money which must be raised by taxation and loans if inflation is to be avoided. By inflation is meant an increase in the general level of prices arising out of an increase in expenditures while goods available for purchase are not correspondingly increased in amount. The problems of war finance are centred round (1) those of expenditure, mainly the avoidance of waste, (2) the reduction of consumption so that saving is maximized, (3) problems of taxation, and (4) the raising of loans. As the war proceeds the economy of the belligerents turns from an uncontrolled to a controlled economy, vast expenditures take place on capital goods such as armaments, machinery, and shipping, and to a less extent on consumption goods such as food, clothing and petrol. A nation at war has to limit its consumption per head in order that goods required for the navy, army and air force may be available without difficulty and, in order that

savings may be at a maximum, the government taking these savings either as taxation or as loans for the prosecution of the war. In Germany, for example, the production of capital goods since 1934 has increased by 100 per cent while the output of consumption goods has increased only fifteen per cent. All reserves of labour and plant have been utilized in re-arming the State, and the savings of the people have been used for financing the huge expenditure on re-armament which Hitler in 1939 put at Rm. 90 milliards or about £6,000 millions since he came into power.

Great Britain. War was declared on Sept. 3, and the first war budget was presented to the House of Commons on Sept. 27, 1939. Faced with the necessity of planning for a three years' war which must involve great and increasing expenditure, Sir John Simon, chancellor of the exchequer, had recourse to heavy increases both in direct and indirect taxation. The direct taxpayer will pay £76,500,000 more in 1939-40, and £160,000,000 in 1940-41, mainly through an increase in the standard rate of income-tax. Indirect taxation will bring in £30,650,000 more in 1939-40, and £66,500,000 in 1940-41 on all alcoholic drinks, tobacco and sugar. This will be supplemented by an excess profits tax at the rate of sixty per cent on excess profits which is based on the principle of the armaments profits duty, but not restricted to armament firms. The excess profits tax cannot at present be estimated, and a tax on the increase of individual fortunes during the period of the war cannot be estimated until after the war. (See BUDGET; EMERGENCY LEGISLATION; INCOME-TAX for details.)

The total expenditure is estimated at £1,933 millions, and this will be met to the extent of £995 millions from revenue, and £938 millions from loans. The estimate of £995 millions is based on the April estimates plus additional taxation, less a reduction of about £54 millions in yield in the original estimates. The detailed figures of expenditure and revenue are given in the article BUDGET.

The changes in income-tax and sur-tax for a married man with three children, with an earned income at the 1940-41 rate work out as follows: on an income of £800, at the rate of 2s. 5½d. in the £; on an income of £1,500 at the rate of 4s. 3d.; and on £2,000, at 5s. 0½d. A standard rate converted into a graduated scale by a series of allowances at one end and by sur-tax at the other does not fit in very logically with the capacity to pay, and it is not unlikely that a new method of assessment may be introduced in the near future. The rates of estate duty are also increased.

The chancellor of the exchequer has not repeated the mistake of taxing too little and borrowing too much at the outset of the war. He is, in a year which includes six months of war, raising by taxation nearly £400 millions more than was raised during 1917-18. The figures of 1939 are in striking contrast with those of 1914. There was national debt then of £650 millions while to-day it is not far short of £8,000 millions. In 1914, pre-war expenditure, apart from defence expenditure, was about £150 millions while to-day it is about £690 millions.

The appointment of a national committee on expenditure, referred to below, will be in the direction of preventing waste. Apart from this there are now anti-waste officers in the ministry of supply and in the air ministry. The treasury has sent an economy circular to all departments, and it is intended by the war cabinet to prune services not essential to the winning of the war. The budget, too, is the proper instrument for bringing about the curtailment of consumption. It is sometimes forgotten how expensive the waging of war is. Already in Nov. 1939, it was costing

Great Britain £6,000,000 a day as compared with £1,500,000 a day in 1914-15, £4,274,000 in 1915-16, £6,022,000 in 1916-17 and £7,389,000 in 1917-18. As the present war continues, the cost will mount up considerably. A modern aeroplane costs from three to seven times as much as a comparable type in 1918; a division of troops in the field costs nearly twice as much to equip and maintain in the field as it did in the last war; the cost of a battleship is now two or three times as great as it was when the navy was last engaged. In the last war the British parliament sanctioned between Aug. 6, 1914, and Nov. 25, 1918, votes of credit to the extent of £8,742 millions, and the war cost Great Britain over £10,000 millions, while if allowances were made for the expenditure of the Dominions, the total would be well over this amount.

The gross national income in the year 1918 can be put at £5,500 millions. The expenditure in that calendar year was £2,700 millions of which all but £200 millions can be regarded as the cost of the war. In short, about fifty per cent of the national income of the community was devoted to war purposes. At the end of 1939 the national income is at the rate of nearly £5,800 millions or £6,000 millions. In view of the present rapid price changes and the great upheaval in employment and profits, there is only a rate of national income at the present time in, say, a particular month. When there is no such thing as unemployment, which should vanish in the autumn of 1941, and when Great Britain reaches her maximum productive war effort, the gross national income, without any change in the value of money, should be something of the order of £7,000 millions. If we apply the same proportion as in 1918 the resulting total expenditure should be about £3,500 millions. Owing to the very great changes in productive capacity per worker, the proportion of the national income which could be afforded for war now would be much greater and without depressing the standard of consumption below that of 1918 it might be sixty per cent of the national income, £350 millions a month, or £4,200 millions a year. Until total national expenditure has reached some figure such as this, Great Britain will not be making her maximum national effort.

The time is approaching when existing British taxes will have passed their maximum yield, and it will be necessary to look round for new sources of revenue. In the first place, Great Britain has not tried new kinds of taxation which have been successful in other countries, notably the sales-tax. Secondly the taxation of incomes on or below £150-£200 per annum is still light. There is no direct taxation of wages for example in the lower ranges of income as in Germany. As taxation stands to-day, there is a risk of undermining that great professional and services class which is rightly described as the backbone of this country.

About two-thirds of the national consumption of Great Britain is by people below the income-tax level, and if more money finds its way into the purses of the wage earners in wartime, there is need to withdraw some of it from the market of consumable goods.

The prospect of the government's borrowing policy cannot yet be estimated with accuracy, as it has not yet (Jan. 1940) been made public. The chancellor of the exchequer has stated that he will borrow as cheaply as possible and it is unlikely that he will pay the high rates which were paid in the last war. He has already wisely decided to tap the small saver before announcing his larger loans, and in this at the end of 1939 had met with remarkable success. A

new issue of savings certificates with a currency of ten years, combined with defence bonds carrying a three per cent rate of interest to be issued at par and repayable seven years from the date of purchase at a premium of £1 per cent were admirably adapted to appeal to the two classes of investors, the wage-earners and the lower ranges of income-tax payers whose abstinence from consumption is so essential at the present time. The yield on savings certificates is £3 3s. 5d. per annum free of income-tax for the whole period of ten years, as compared with £2 18s. 4d. on the present series, an increase of 10d. The yield on defence bonds is £3 2s. 7d. per annum including the premium of £1 on redemption at the end of seven years. The £500 limit on individual holdings of certificates has been retained; no individual will be allowed to hold more than £1,000 of the new bonds. The terms offered to the small saver are generous. It requires only organization up and down the countryside, throughout towns and villages, in shops and industries, by means of a roaring, tearing propaganda to make these loans a great success.

It will be seen that British public finance since the outbreak of war rightly commands the confidence reposed in it both in Great Britain and abroad. The budget, as it has not been in Germany since 1934, has been presented year in and year out. The balance between taxation and loans has been followed and borrowing has been kept within bounds. The chancellor of the exchequer has not hesitated to increase taxation wherever necessary. Moreover the importance of public expenditure has not been overlooked. In December, a select committee on national expenditure, of 28 members of the House of Commons, was appointed. The function of the select committee is to see that the nation is obtaining full value for its vast war expenditure and that there is no waste. The terms of reference exclude expenditure on social services from the scope of the enquiry. There was a similar select committee appointed during the last war, but not till 1917. That select committee delegated much of its work to sub-committees which sat in the spending departments and it is understood that it saved many millions of pounds.

Australia. In presenting the budget to the Commonwealth parliament on Sept. 8, 1939, the Rt. Hon. R. G. Menzies, prime minister and treasurer of Australia, estimated revenue for the year 1939-40, based on 1938-39 rates of taxation, at £96,030,000, and expenditure at £101,916,000. To meet the deficit of £5,886,000 income-tax was increased by ten per cent on the incomes of individuals derived from personal exertion or property. The company-tax was raised to 1s. 7.8d. in the £, and tax rebate in respect of dividends received by absentee holding companies was abolished. These three proposals were estimated to produce increased direct taxation of £2,360,000. The rate of the sales-tax, leaving the exemptions as they stand, was increased from five per cent to six per cent and the method of calculating the sale value in respect of imported goods was altered. The total additional revenue thus from the sales-tax is estimated at £1,142,000. By certain increases in customs and excise duties £2,130,000 was to be raised. By these new proposals a sum of £5,910,000 was budgeted for. The prime minister said that of the defence expenditure something over £12,000,000 was to be taken from the budget, £2,000,000 from balances in the trust fund, and about £19,000,000 from loans.

A supplementary financial statement was presented in the House of Representatives on Nov. 30, 1939, by the acting treasurer the Hon. P. C. Spender, who declared that

the financial policy of the government was to finance the war effort by a balanced programme of taxation, borrowing from the public and borrowing from the banking system. The balance between these three methods would change from time to time according to economic circumstances, and for the time being the government had decided that the balance would be weighted towards borrowing with the assistance of the banking system, rather than towards taxation. The government was of opinion that to increase taxation again would delay recovery and would interfere with the full prosecution of the war programme. The government would before the close of the financial year transfer the emphasis of its financial policy from borrowing from the banking system as economic recovery got under way, firstly to borrowing from the public and, secondly, to taxation. Part of the borrowing plan would be an issue of savings certificates. Early in 1940 the government would bring forward a comprehensive scheme of war taxation. If this were done, and other controls on exchange prices and capital investments maintained, Australia would avoid the evils of excessive credit expansion.

The outstanding feature of this supplementary budget was the greatly increased estimate for defence and war services. The revised estimate was increased from £33,137,000 to £62,014,000 of which £46,181,000 was provided from the loan fund and included capital war expenditure of £15,583,000 and pre-war capital defence work £20,383,000. The total estimated expenditure from revenue was £101,452,000. The estimated total receipts for the year were £101,490,000. Under the budget and supplementary measures, new taxation amounting to £8,150,000 is to be levied during the present financial year. This includes the raising of the rate of company-tax to 2s. in the £ as a result of the supplementary budget.

Canada. In the first three months of the war, orders to the value of \$25,000,000 were placed for military requirements in Canada, \$9,000,000 in Britain, and \$10,000,000 worth of aeroplanes from the United States had been purchased. This was in addition to the \$25,000,000 of railway equipment required under the emergency conditions. The minister of finance, the Hon. A. L. Ralston, estimated at the end of November that the programme for the first year of war would cost the Dominion \$315,000,000. Canada's contribution in the first phase of the war has been mainly economic—the provision for a steady flow of munitions, aeroplanes, food and supplies.

For the year ended March 31, 1939, the revenue was \$502,000,000 and the expenditure \$557,000,000. In introducing the war budget on Sept. 12, 1939, the acting finance minister, the Hon. J. L. Ilsley, estimated the expenditure at \$651,000,000 as compared with a total expenditure estimated last April of \$550,000,000, and deducting the total revenue of \$495,000,000 he arrived at an anticipated deficit of \$156,000,000. In order to meet this increased expenditure, the Canadian House of Commons passed legislation increasing import duties on wines, spirits, tea and coffee. It also passed an act to amend the Special War Revenue Act by which excise taxes were similarly increased. In addition to this the Canadian House of Commons also passed an Excess Profits Act and legislation increasing the income-tax both of individuals and of corporations. The excess profits tax was to prevent profits rising to high levels. The schedule of rates ranged from 10 per cent on profits in excess of 5 per cent but not exceeding 10 per cent of the capital employed, to 60 per cent on profits exceeding 25 per cent of the capital. The amended

income war tax provided for a war sur-tax of 20 per cent on individual incomes other than corporations. The corporation income-tax was raised from 15 to 18 per cent on the net income of corporations regardless of whether they came under the excess profits tax or not. In the case of corporations issuing consolidated accounts, the income-tax was raised to 20 per cent. It is interesting to note there was no increase in the sales-tax, but the base of this tax was broadened by removing from the schedule of exemptions electricity and gas used for domestic purposes, salt and smoked meats, and canned fish. An act was also passed creating a department of munitions and supply. None of the self-governing Dominions has shown greater determination and greater courage in regard to its war finance than has the Dominion of Canada, and the greatest emphasis has been laid on the production of munitions in destroying the menace of Hitlerism. Sir Wilfrid Laurier used to say that the nineteenth century was America's, but the twentieth would be Canada's. If the present war is a long one, it may well transform Canada into the industrial and financial citadel of the Empire.

New Zealand. The New Zealand budget for the year 1939-40 presented by the Rt. Hon. M. J. Savage, acting minister of finance, on Aug. 1, 1939, budgeted for a revenue of £38,260,000, and an expenditure of £38,243,000. On Sept. 26 the Hon. W. Nash, minister of finance, brought forward a supplementary budget to raise £9,750,000 which will be required to finance war activities for the remainder of the financial year. A substantial portion of this sum is to be obtained by the following taxation increases: 3½ per cent on death duties, 3d. per gallon on beer, 15 per cent on wines and spirits, 25 per cent on tobacco, and a gold tax of 75 per cent of the difference between the prices on Aug. 24 and the date of sale, and also a surcharge of 1d. on all letters. The total of £9,750,000 will be applied to expenditure in New Zealand only. The finance minister estimated that about £20,000,000 would be needed for the first year of the war, and probably equal sums later. In addition, all New Zealand produce available for export is to be sold to the British government. This shows the great war effort of the Dominion, with only a million and a half people, and an average annual governmental expenditure on revenue account of only £27½ millions.

Union of South Africa. In the budget put forward in March 1939 by Mr. Havenga, the then minister of finance, for the year ending March 31, 1940, revenue was estimated at £44,110,000 and expenditure at £44,860,000. Mr. Havenga referred to the cost of South Africa's "huge programme of armaments". South Africa is not merely guarding, in co-operation with the British naval station at Simonstown, one of the Empire's most important sea routes, but is pledged to assist any of her British neighbours in South-East Africa—the Rhodesias, Kenya, and Tanganyika—which may be threatened. The amount earmarked on the estimates for defence expenditure from revenue funds during the year is £2,237,620, and, in addition, the intention is to spend certain sums from loan funds in accordance with the £6,000,000 development scheme outlined in 1938. In addition to this the government has decided to contribute £300,000 from revenue funds. The minister also announced that £1,500,000 would be appropriated from loan funds for defence purposes, and that the bulk of the 1938-39 surplus of £1,650,000 would also be devoted to defence purposes.

Mr. J. H. Hofmeyr, the new minister of finance, pointed out on Oct. 25, 1939, that the effect of the war on the

economic system was to provide a stimulus for increases in prices, profits, interest rates, and so forth. National interests, however, required that the greatest possible economic stability should be maintained. The Union was very favourably placed because of its strong financial position. The Reserve Bank held £112 in gold for every £100 which it owed to the public, including many deposits with it by other banks. He announced that in addition to the programme of capital expenditure begun before the war there would be the growing commitments for defence. This was, he said, not a time to borrow money in London, nor to cut down capital expenditure nor yet to substantially increase taxation. The fixing of the price of gold at a figure below the price in the open market allowed the government a sufficient margin of profit, and was the soundest policy for meeting expenditure.

The Union of South Africa produces one-third of the world's gold production, and during the calendar year 1939, the Transvaal output was 12,819,344 fine oz. against the previous record of 12,156,629 fine oz. in 1938. The value of so important a supply of gold adds greatly to the war potential of the British Commonwealth of Nations.

France. War finance in France goes back in reality to the steps taken by France's able finance minister, M. Reynaud. The economic and financial decrees were published in the *Journal Officiel* of April 22, 1939. They fell naturally into three groups—rearmament, finance and labour, and it is with the first and second of these that we are now concerned.

The increased rearmament expenditure during the current year (1939) under these decrees was about Fr. 15 milliards (£83 million) over and above the amount allocated in the budgets for that year. The war ministry estimate was increased by £25 million, the navy estimate by £27 million, and the air estimate by £30 million.

The financial decree dealt with income-tax evasion, profits of the national defence industries, the turnover tax, death duties on farm properties, public works expenditure and with the investing of capital. The scope of the financial decrees is briefly as follows: Taxable income is assessed on the visible expenditure of taxpayers where necessary in order to cope with evasion. There is no right of appeal. National defence industries have their profits limited to 30 per cent. A special tax rising progressively from 50 per cent to 100 per cent is to be paid on all profits exceeding 6 per cent. A special armaments-tax of 1 per cent on all payments, excluding payments for the purchase of bread, milk and newspapers, is to be paid by all dealers, factors, middlemen and shopkeepers, including importers and co-operative societies. To compensate for this the tax on business and professional premises is reduced by 20 per cent. Farms not exceeding Fr. 100,000 (£600) are exempted from death duties, and for those not exceeding Fr. 200,000 (£1,200) death duties are reduced by half. Public works expenditure, including road maintenance, is reduced by about 1,500 million francs (£8,500,000) during the current year. The state and the various boards dependent on it are forbidden to invest public moneys in any private enterprises. Existing shareholdings in trade and industry, with certain exceptions, are to be sold and the proceeds used for the amortization of the national debt. The public services under the labour decrees were pruned, the men dismissed being offered alternative employment or compensation. The length of the working week was raised to 45 hours, at the rate of 5 per cent above normal rates of pay.

On Nov. 17, a special war-tax of 15 per cent was levied,

retrospective from Nov. 1, on the incomes of all men, with certain exceptions, of military age (20–49) not serving with the forces, police, merchant marine or in certain zones of the fishing fleet. The first 7,000 francs of the annual income is exempt and the sum exempted rises by 1,000 francs for each child up to and including the fifth. A general war-tax on all incomes of 5 per cent was levied from Jan. 1, 1940, in place of the previous 2 per cent tax.

In the budget for 1940 passed on Dec. 28, M. Reynaud separated the civil from the military expenditure. The entire civil expenditure, amounting to 79.9 milliards francs (about £450,000,000), is collected together within the present budget. The revenue, slightly more than the expenditure, is obtained from taxation. All military expenditure is met exclusively from the proceeds of treasury bonds or loans to be issued later. There is a check on the expansion of civil expenditure since any increase would have to be met by further taxation. Allowances to families of mobilized men, estimated at over 14 milliards francs (£79,800,000) are included in the budget. The Chamber also voted extraordinary war credits amounting to 259 milliards francs (£1,476,000,000) for the current year. The total expenditure in 1940 will thus be of the order of 340 milliards francs (approximately £1,926,000,000).

France has huge reserves of which only a part is represented by her stocks of gold, and there is plenty of money on the market. M. Reynaud announced that 25 milliards have been repatriated since the beginning of the war, and that 10 milliards of gold or foreign currencies have been converted into francs. These sums, added to 26 milliards francs repatriated during the ten months preceding September give a total of 60 milliards of francs, excluding repatriated foreign stocks or debentures. The reasons of the return of gold in such large quantities are that with the exchange control applied last September, the exchange office and the treasury required information of all assets placed abroad by private persons and companies. The two declarations made it almost impossible to conceal holdings abroad, and these had, therefore, either to be brought back to France, or kept in the form of foreign exchange and made known to the revenue authorities. On Dec. 13, 1939, a comprehensive agreement between the British and French treasuries was announced. Both governments undertake: to avoid during the war any alteration in the rate of exchange; to enable each other to cover their requirements in the other's currency; to use that currency without having to find gold; not to raise any foreign loan or credit except in agreement or jointly with the other government; not to impose fresh restrictions on the imports from the other country during the war for protective purposes or for exchange risks. The two governments will share certain items of expenditure, such as financial assistance to Poland and other countries. In general the French contribution will be forty per cent and the United Kingdom contribution sixty per cent of the total. There will be also frequent meetings between the two treasuries to settle technical questions and to examine more general problems. The agreement remains in force until six months after the signature of the treaty of peace.

Germany. In the Third Reich no budget has been published since 1934, and it is therefore difficult to examine the German financial structure in detail. The outstanding fact since Hitler came into power in 1933 is the huge expenditure on rearmament, which Hitler himself just before the invasion of Poland estimated at 90 milliards of marks (£6,000 million). Since this has been achieved in the space

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of six years, and more especially since 1937, it is important to examine from what sources the costs were met. It was not difficult during the first few years when taxes were low, and many millions unemployed, to turn over to a controlled economy. By 1937, full employment was already in existence, and there were signs of strain in the financial structure. Rising government expenditure year after year exceeded revenue by many millions of marks. During the first few years of the Nazi regime, when the government income was low and the capital market drained of funds, the government relied primarily on short term borrowing. Contractors were permitted to draw bills against the government or its agencies, and these bills were discounted by banks which in turn could present them for re-discount with the Reichsbank. The bills were like commercial bills, except that their maturity date could be extended from time to time. They tended to inflate the circulation, but the government considered such an inflation safe so long as it was accompanied by a corresponding increase in production and employment and prices were kept under control. In the spring of 1939 tax-anticipation certificates were introduced. This plan was in fact a forced loan by the state. Under it, the government, the municipalities, the defence department, the state railways and the post office, paid cash only for sixty per cent of their supplies, and the remaining forty per cent was paid in taxation credit certificates; contractors were authorized to adopt the same method in paying sub-contractors. The new finance plan never won the confidence of the public, and when the value of the certificates fell to 94 per cent of their face value, the scheme was dropped from Nov. 1. The chief aim of the plan was to prevent a dangerous increase in the note circulation and its failure may be regarded as a covert admission that the efforts to avoid the normal effects of inflation have failed. The banks were already holding delivery certificates, and, with the additional tax certificates their liquid position suffered further deterioration. Since the declaration of war, the fighting forces have been empowered to meet their expenditure by issuing special bills called *Wehrmachtsverpflichtungsscheine*, which are discounted by the banks. These bills are for not less than Rm. 10,000 and are mainly used for financing war industries. They are not re-discountable, nor can they be used as collateral for loans. They have been devised to avoid inflation, like their predecessors, but it is doubtful whether they will be any more successful because they will swell the non-liquid holdings of the banks, while the more liquid assets will be brought quickly to the Reichsbank for re-discounting. The amount of this secret borrowing cannot be estimated with any accuracy, but in the five years ended March 31, 1938, it must have been at least of the order of Rm. 15 milliards.

Side by side with this short-term borrowing, the Reich has been able to vote a large number of medium and long-term loans. From 1935 to 1938 inclusive, such loans amounted to 15.6 milliard marks. Public borrowing was greatly facilitated by the practical monopoly of the capital market by the government. Only a few private issues have been permitted. This public debt in Dec. 1939 had reached the level of Rm. 35,550,000,000 (approx. £3,000 m.). During August and September it increased by Rm. 2,720,000,000 (£266,000,000). Savings in unemployment relief due to full employment, in the five years ended March 31, 1938, amounted to Rm. 7.4 milliards.

To-day Germany is the heaviest taxed country in the world. The National Industrial Conference Board of New York has recently shown that taxation per head in Germany

was lowest in 1913 and highest in 1938, despite the comparatively slight increase in her public debt. The proportion of national income appropriated by the government by taxation was also highest in Germany. The collection of taxes has recently been made stricter, and the rates are much higher especially since war broke out. The income-tax on all incomes over Rm. 2,400 (approx. £150) a year, already severe, has been increased by 50 per cent, and special taxes of 20 per cent on the retail prices were imposed over and above the existing duties on luxuries including beer and tobacco. It is interesting to compare the taxation of the lower incomes in Germany with those in Great Britain. In Great Britain, on an income of £250, an unmarried man pays £11 13s. 0d.; a married man (without children) £2 6s. 0d. In Germany he would pay, respectively, £44 2s. 0d. plus 50 per cent and £24 10s. 0d. plus 50 per cent and if married over five years and still without children £34 6s. 0d. plus 50 per cent.

It is understood that new war-taxes and measures for special saving in war-time are to be applied early in 1940. The proceeds will help to defray the cost of the war, which is estimated at Rm. 50,000,000,000 a year as compared with Rm. 35,000,000 a year in the last war. War costs have risen all round, and are not confined to munitions. The German soldier in 1914 got 35 marks a month; to-day he gets 170 marks in which are included family allowances.

The large expenditure on armaments, which is approximately five times greater than that of the United Kingdom since 1934, has been paid for by keeping down consumption to the somewhat low level of 1932-33 and by sweeping away into the Reich's coffers by means of a rigid control of capital and industry the savings of the people. Prices and wages have been ruthlessly clamped down, and in October were forced back to the level of 1936, although subsequently there has been some modification so that the monetary burden which was being laid disproportionately on the working classes will to some extent be improved.

There are signs that the German financial machine is bearing an enormous strain; inflation in the note circulation of the Reichsbank which increased 44 per cent in the twelve months previous to the outbreak of war has not passed without comment, although Dr. Funk has stated that the aims in German war finance were, no inflation, no deflation, strict control of prices and wages and the taxing away of war profits. (See also WAR POTENTIAL OF LEADING EUROPEAN COUNTRIES.)

Space precludes a discussion of the treatment of Germany's foreign creditors since the Nazis came into power in 1933. Foreigners have lost down to the beginning of Jan. 1937 Rm. 7.45 milliards. It has been calculated that only one-fifth of the contractually established claims for interest, and only one-tenth of the capital were repaid in the way stipulated. The repudiation, or what has amounted to repudiation, began on the standstill front which dealt with the short-term foreign credits. This was followed by a suspension of the full interest in the medium-term loans, and this in turn was followed by a moratorium. A good account of the breach of faith in Nazi Germany's foreign loans is given in Dr. Nurbert Nuhlen's book *Der Zauberer: Leben und Anleihen des Dr. Hjalmar Horace Greeley Schacht*, first published in 1938 in Switzerland and recently translated into English. (G. F. S.)

WAR POTENTIAL OF LEADING EUROPEAN COUNTRIES. To-day a war is not fought only on land, sea, and air. With the advance of industrialization, the machine and chemical processes have been brought to the

soldier, just as they have been brought to the worker. To-day a war is totalitarian. It means the co-ordination of every section of the national life, of every brain and nerve in the country. Great wars are no longer decided on the battlefield. A country at war has to see that it obtains a plentiful supply of war materials as well as of food. It must reduce to a minimum, energetically and speedily, the amount of man-power and materials consumed for purposes other than war, and divert the surplus entirely to producing directly or indirectly the maximum of war effort. A belligerent must, at the same time, keep its industrial production intact so that it can not only produce munitions of war and supplies for the Services, but export goods to pay for imports. Otherwise it will have to use up its gold, exchange and foreign investments to pay for them.

In the following paragraphs it will be necessary to deal with the industrial power of the belligerent, its power to produce armaments, chemicals, etc. This alone is only one factor. It must have also a continuous supply of raw materials, especially iron, coal, petrol, rubber, copper, bauxite, lead, and manganese. There are some thirty-four raw materials which are required in war. Germany, for example, has four of these in sufficient quantities. There are seven she requires to supplement by imports and twenty-three for which she relies completely on imports. Some of these are so bulky that it is not possible in anticipation of hostilities to keep large stocks. It is possible to substitute some of the materials by others, thus copper can to some extent be replaced by aluminium which is manufactured from bauxite. Some materials are of vital strategic importance, manganese for making steel, and chromium for armour plates and projectiles, stainless steel, and high-speed cutting tools. There are other metals required for hardness and strength; tungsten, molybdenum, antimony and vanadium. Mercury too is necessary as a detonator in high explosives and ammunition. Rubber is now of great importance owing to the mechanization of armies.

If we are to judge from the last war, the total national consumption in wartime is not very different from the total peace consumption, although wartime consumption

is much greater in certain directions, *e.g.* petrol, rubber, and bauxite. In some articles there may be a saving as in Germany, which can almost dispense with heavy fuel-oil requirements for her 2,328 ships now being driven off the seas. The productive power of the country is simply shifted from ordinary civilian requirements to war essentials. The quantity of raw materials and food imported depends not only on the country's natural resources, but on its ability to draw, as can Great Britain, on foreign sources of supply, which in turn depends on means of transport, and of payment.

The Federal Reserve Bulletin of Dec. 1939 contains a careful estimate of the Federal Reserve Board of the assets of various belligerent and neutral countries, in forms which can be converted into dollars with reasonable certainty. The total for the Allies is a minimum figure, being the market value and covering only United States securities. There are, in addition, considerable British holdings of non-American securities which American investors would find attractive; Canadian industrials, gold mines and rubber companies. The table below gives the details:

The outstanding fact from these figures is the strong position of the Allies relatively to that of Germany. On the other hand, the value of the dollar is lower now than in 1914, and in 1914 the Allies could purchase on credit.

Great Britain. Great Britain is a rich creditor country; her navy and merchant marine are decisive factors as in the last war. So long as Great Britain has command of the seas, she has the world to draw on, especially the British Empire, for food supplies and raw materials. Unlike Germany, she is not forced to squander man-power in the production of *ersatz*, but can economize by importing finished goods. She is placing in the field 3,500,000 men, excluding the contingents which are arriving, or have arrived, from the Dominions, India, and other parts of the Empire. If statistics relating to man-power, merchant shipping, petrol, coal, iron ore, steel, copper, rubber, cotton, wool, wheat and other articles are compiled for the British Empire, France, Germany, Russia, the United States and other countries, it will be seen that neither the Allies nor Germany can depend on their own supplies,

Holdings of Gold, Dollar Balances and American Investments, August 1939

(\$ millions)

	Gold reserves (1)	Dollar balances (2)	Marketable securities (market value) (3)	Total cols. 1-3 (4)	Direct invest- ments (5)	Total cols. 4 and 5 (6)	Comparable figs. for 1914
UNITED KINGDOM	2,000	595	735	3,330	900	4,230	2,765-3,965
FRANCE	3,000	315	185	3,500	80	3,580	1,080-1,280
CANADA	215	355	500	1,070	560	1,630	115 (gold only)
OTHER BRITISH AND FRENCH COUNTRIES .	540	—	—	540	—	540	—
TOTAL ALLIES	5,755	1,265	1,420	8,440	1,540	9,980	
GERMANY	150	10	—	160	—	160	1,030-1,330
ITALY	190	10	—	200	—	200	—
NETHERLANDS	770	160	470	1,400	380	1,780	660-860
SWITZERLAND	590	285	375	1,250	170	1,420	—
U.S.S.R.	1,000	—	—	1,000	—	1,000	—
OTHER EUROPEAN COUNTRIES	2,190	430	130	2,750	120	2,870	—
LATIN AMERICA	660	390	40	1,090	10	1,100	—
FAR EAST AND OTHERS	375	355	380	1,110	180	1,290	—
TOTAL NEUTRALS	5,775	1,630	1,395	8,800	860	9,660	—
ALL FOREIGN COUNTRIES	11,680	2,905	2,815	17,400	2,400	19,800	8,100-10,100

30 WAR POTENTIAL OF LEADING EUROPEAN COUNTRIES

and that only in the production of steel is there substantial equality. The Allies have a much greater output of domestic iron ore and coal, and are able to obtain without much difficulty raw materials necessary for the prosecution of the war; their economic strength is overwhelming.

In industry Great Britain has considerable reserves, as the country has not been mobilized except during the last three years, and then only partially; a contrast to what has been taking place in Germany. During the last fifteen years, there has been a revolution in British industry. In the engineering industry, for example, the physical output per operative in the 1930-35 period has risen as compared with 1924 by not less than 52 per cent; in textiles by 37 per cent; in public utilities and government departments by 27 per cent, and in agriculture by the same amount. Since 1924, the productivity of employees in factories has risen by the surprising figure of 25 per cent. It is, of course, possible for output in an industry to increase although the amount of employment which it has given has fallen. If Great Britain hastens to employ its increasingly efficient labour power in raising the national output of goods and services, and to do away with unemployment for the duration of the war, it would have a greater war potential than any other country in the world, with the possible exception of the United States. The national income of Great Britain is somewhat greater than that of Germany, and the per capita income is very much greater. She is therefore able to turn to war production a much greater amount of the national income, goods, and services produced. At the beginning of the war, Great Britain had a gold reserve of the order of £500 millions and in addition a considerable amount of foreign exchange and foreign investments. At the end of 1938, according to Sir Robert Kindersley, British capital overseas in quoted securities and unquoted investments amount to £3,692 millions.

France. France's economic war potential is greater to-day than before the World War. As a result of the Treaty of Versailles, the rich industrial region of Alsace-Lorraine was restored to her, and in 1929 the output of iron and steel was double that of 1913. Her industrial production, which was slightly over 48 per cent of that of Germany in 1913, was over 66 per cent of that of Germany in 1929. France cannot manufacture munitions to the extent that Germany can, but can increase her output to a considerable extent, provided her industrial areas behind the Maginot Line are kept more or less intact. Secondly, while France is not completely self-sufficient in foodstuffs, the amount of agricultural land available per inhabitant is twice as great as that of Germany; in this respect she is much superior to Great Britain which has to import at least two-thirds of her supplies compared with one-fifth in the case of Germany. Apart from food, France is, with one exception, much on the same level as she was in 1913-14 as regards raw materials. Although she is deficient in coal, her own coal meeting only 60 per cent of her needs, she is now self-sufficient in iron ore, and has a large surplus for export. Oil seeds, nickel, chromium, graphite, and phosphates, she can obtain from her colonies. So long as Great Britain and she control the seas, she is able to draw on foreign supplies as required. She has a considerable mercantile fleet, and she holds about two and a half times as much gold to-day as at the end of 1913.

Germany. Germany since 1936, indeed, since the Nazis came into power in 1933, has produced armaments at a great rate, while consumption goods have not greatly in-

creased. Before the war, she was suffering from economic tension, and had been, as it were, in a state of siege since the second four-year plan of 1936. She has been able since the war to import food and raw materials from her eastern neighbours, and from the Baltic. In ordinary times she can satisfy 80 per cent of her requirements, including fodder, by home production. She is compelled to import the remaining 20 per cent; but this includes some vital imports, among them fats and feeding stuffs, which if not imported will in the long run mean deterioration in the supply of milk and cattle, and this will also detrimentally affect the home food consumption. She lacks too, important raw materials, notably oil, although with the introduction of the second four-year plan in 1936, she has made a great effort to produce it from coal. The importance of oil in modern warfare is well known. Only 36 per cent of Germany's total consumption can be produced from domestic raw materials, and she has to depend on Rumania, Russia, and Poland for further supplies, which, however, cannot meet her requirements, especially in wartime, when she will require at least ten million tons a year, as compared with 7,500,000 tons, her consumption in 1938. In the last war, when Lorraine and Silesia were still in Germany, Germany was 70 per cent sufficient in iron ore, but to-day only 25 per cent of her requirements are supplied by German mines, and it is doubtful if the Hermann Goering iron works can raise this above 30 per cent, although some economy might be achieved by the greater use of scrap. Her main source is Sweden. Germany is dependent upon imports for at least 50 per cent of the fats which are required for munitions as well as for food. Germany's gold holdings, foreign exchange, and investments abroad are dealt with above. The Reich is in a much less satisfactory position than in 1914. At the outbreak of the last war, Germany was next to Great Britain in the list of creditor countries, rivalling France for second place. She was exporting capital year after year abroad. To-day, Germany is a debtor country. As a result of the world war, she lost her foreign assets, and to-day her indebtedness to foreign countries is very much greater than her foreign assets. She has to depend on herself, and on her immediate neighbours for supplies of food and raw materials as she has not the command of the seas. She has allowed her industrial plant to depreciate in recent years at a rapid rate; the condition of her railways, and indeed of many of her factories, is far from satisfactory. By the middle of 1938, her rolling stock was actually 10 per cent less than at the beginning of 1929. Her strained finances are referred to in the article on war finance. On the other hand, she has great organizing ability, and entered the war with several years of preparation behind. *Wehrwirtschaft*, the science of organizing the country's life for war has been studied and practised since the last war, and in this respect Germany is far superior to both Great Britain and France.

Italy. Italy is relatively poor as compared with Great Britain, France, and Germany. Italy produces steel, but her output is less than one-fifth of Great Britain's. Her output of motor cars, is only 16 per cent of Great Britain's; she is said to be capable of turning out from 250 to 300 aeroplanes a month. Her home production of foodstuffs is about 95 per cent of her requirements if expressed in calories, but Italy is very deficient in raw materials. She can only supply 19 per cent of her requirements of minerals. She has practically no coal, iron ore, copper, petroleum, or other minerals. Her position in time of war would be exceedingly vulnerable in other directions owing to the

superior power of the British and French navies in the Mediterranean. Her gold holdings and investments abroad are also far from being able to bear the strain of a long war.

Russia. In recent years, Russia has paid considerable attention to industrial production, but she is still of little importance as a great exporter of raw materials. She requires production mainly for herself. In total value, her export trade does not compare with any of the British Dominions or India, and she ranks behind Denmark. She cannot export, especially iron ore and oil, without overcoming great transport difficulties. The only really satisfactory route for heavy traffic between Germany and Russia is the Baltic. The Baltic ports, however, are at the opposite corner of European Russia from the Russian iron ore and oil fields. It is at present impossible to take oil tankers by the Danube from the Black Sea to Germany, as this would mean much constructional work on the Danube, and complicated transshipment arrangements. The railways are unable to solve the transport problem. Immense distances are involved and gauges are different. Professor Hopper of Harvard university, who spent several years in Russia after the Great War, concludes¹ that Russian help for Germany can become important only if German engineers have had a minimum of two years to reorganize the Soviet industrial and transport systems, and that even then it may not be decisive. He says, for example, that to transport 8,000,000 tons of oil every year from the Caucasus to Germany would require no fewer than 55,000 tank cars, or about twice as many of such cars as Russia now possesses. To haul the 2,351,000 tons of soya beans from Manchuria to Germany—a distance of 4,300 miles—would require 325 trains containing 16,250 freight cars constantly under load, not counting the return journey. Professor Hopper concludes that the delivery to Germany of oil, soya beans, and manganese ore is an undertaking which would tax the Soviet facilities and, except in the case of manganese ore, could be executed only in part. In a short war of big offensives, Russia could not give decisive aid to Germany, but if the war lasts for two years without major engagements, Germany might be able to accumulate war stocks and reorganize Soviet industry and transport so that Russian aid might be of great value. With the exception of the United States, there is no country which enjoys such a degree of self-sufficiency as Russia to-day. Not only does she produce her own food, but can satisfy her own requirements in coal, iron ore, and petroleum. She requires only tungsten, nickel, antimony, tin, and natural rubber among raw materials. It is, however, her deficient transport that prevents the mobilization of her resources. (See also ECONOMIC WARFARE; INDUSTRY, WAR CONTROL OF; WAR FINANCE.) (G. F. S.)

WELFARE AGENCIES, WAR. In spite of months of preparation for the possibility of war, no period in the modern history of Great Britain witnessed a greater upheaval in the national way of life than occurred immediately upon the outbreak of war with Germany on Sept. 3, 1939. To cope with the many problems in re-adjustment arising from both the redistribution of population and the nervous tension induced by the new technique of warfare there was an expanding need for organized welfare work. By far the largest share in this was borne by the Women's Voluntary Services for Civil Defence. Born in 1938, under the chairmanship of the Dowager Marchioness of Reading, the W.V.S. had grown by May 1939 to a strength of

256,000, and by the first fortnight of the war to double that number. When the order was given to evacuate the danger areas 200,000 members assisted in the vast movement of population. (See EVACUATION.) In the reception areas the W.V.S. had three main tasks—allocation of buildings, reception at railheads and dispersal to billets, and care after arrival. The continuing after-care entailed nine separate activities—management of buildings, transport, feeding, health, recreation, clothing, maternity care, infant welfare, and general advisory services. A.R.P. instruction was another important activity, but the biggest development in W.V.S. work was in the establishment of canteens for civil defence workers and evacuees.

Another welfare agency established after the outbreak of war was a group of citizens' advice bureaux offering help in solving wartime problems.

Of special importance in a war which, in its beginnings at least, seemed to be one of attrition was the entertainment of the defence forces. In September the Navy, Army, and Air Force Institutes, which are responsible for an extensive canteen service, organized an entertainments branch known as the Entertainments National Service Association (E.N.S.A.), with Mr. Basil Dean as director and Sir Seymour Hicks as controller. Twelve concert parties sent to the camps on Sept. 25 provided 82 performances for 45,663 men in their first week. In October six mobile cinemas were provided, and later the amount of entertainment both living and mechanical greatly increased. The total number of performances given up to Dec. 10 was 2,973, the attendances amounting to 1,159,895. On Nov. 15 the war office gave permission for entertainment to start in France, and in the following three weeks 47 living performances and 32 cinema shows were given, providing entertainment for 61,490 men.

An extensive welfare programme on behalf of the forces was also undertaken by the Y.M.C.A., more than 420 branches serving the men in the home field, and 24 operating with the B.E.F. For isolated units at home 47 mobile canteens were at work by the end of December. Canteens were also opened at London termini and provincial railway stations. A comprehensive educational scheme for troops at home and overseas, and plans for work among prisoners of war were other phases of Y.M.C.A. activity. The war service fund appeal under the leadership of Lord Athlone received gifts totalling £130,000.

Other organizations undertaking canteen and general welfare services both at home and abroad included the Church Army, the Salvation Army, the Youth Fellowship, and the Y.W.C.A. In France, *Le Foyer du Soldat* was providing for the French forces comforts similar to those afforded by the Y.M.C.A.

A new scheme for the welfare of British soldiers, to be called the Social Welfare Scheme for the Troops, was announced by Mr. Hore-Belisha, minister for war, in November. The aim of this was to ensure that every soldier in home territory should be given as many comforts and amenities as possible. By the end of the year the scheme had already begun to operate, with Lt.-Gen. Sir John Brown as war office adviser under the adjutant-general.

Many organizations receiving gifts for men in the forces or in other war service sprang into being directly the war began, and their work was centralized under Sir Alan Hutchings, director-general of voluntary organizations, Berkeley Square House, London. The collection and distribution of books and periodicals for the defence forces

¹ *Foreign Affairs*. New York, No. 2. (January 1940). "How much can and will Russia aid Germany?"

was co-ordinated in November under the City of London Territorial Army and Air Force Association.

In December two committees were set up in London and Paris to send gifts of materials to the wives of French soldiers in France and gifts to the British Expeditionary Force, and to assist in entertaining British soldiers on leave in France. The gifts included 3,000,000 cigarettes to France and 12,000 to home stations. Earlier, 1,000,000 cigarettes had been provided for British troops through Lord Nuffield's gift of £1,000 to the Overseas League Tobacco Fund. Lord Nuffield also gave £1,000 to the Veterans' Association to provide at the Allenby (Services) Club entertainment and recreation for soldiers passing through London.

For the welfare of internees and prisoners of war a joint committee was formed in Great Britain with the approval of the home office and war office. (D. A. C.)

WOMEN'S WAR ORGANIZATIONS. During 1939 the special qualities which women can bring to public service acquired an importance unprecedented even in the years 1914-18. In the early months of the year, when war was smouldering in Europe, there was a strong impulse among British women of all ages and classes to contribute



Fox Photos]

STUDENTS IN TRAINING FOR THE WOMEN'S LAND ARMY

to their country's defence needs, and when the conflict came in September it found a large force of women already members of the Service organizations. (See WELFARE

AGENCIES, WAR.) Twenty thousand had enrolled in the Auxiliary Territorial Service alone since it was constituted in Sept. 1938; in Nov. 1939 began the recruitment of a further 20,000, and in the first fortnight after the war office appeal nearly 10,000 applied for enrolment. Dame Helen Gwynne-Vaughan, chief controller of the A.T.S., with the rank of major-general, supported the recruiting drive by a broadcast appeal. On Dec. 14 she visited the British lines behind the Western front, with the object, it is understood, of determining what part the A.T.S. might carry out with the British troops.

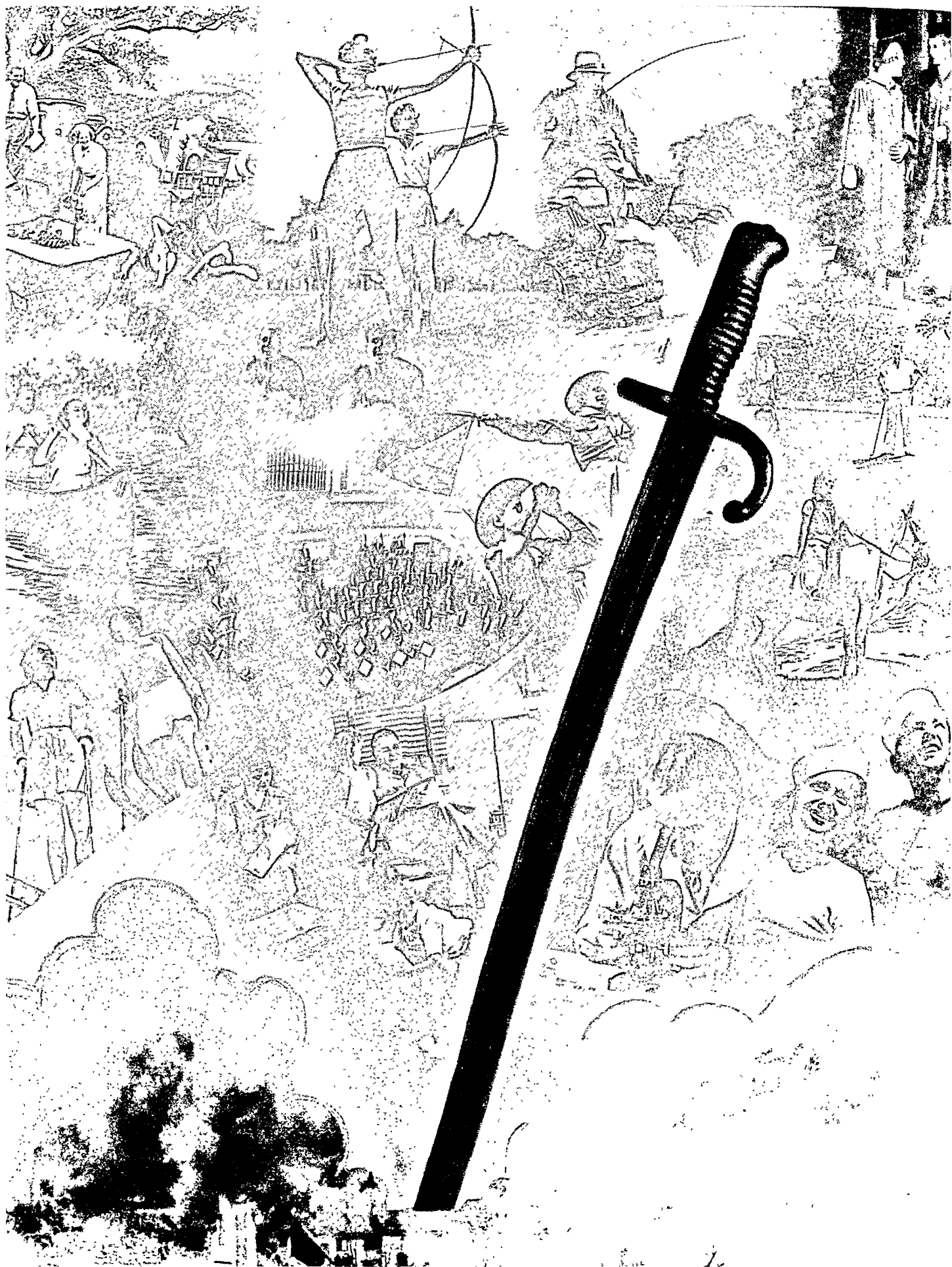
In July 1939 the Women's Auxiliary Air Force was constituted a separate service from the A.T.S., of which it was originally a branch, and on July 2 members appeared for the first time in their uniforms of R.A.F. blue at the national defence rally in Hyde Park. Miss J. Trefusis Forbes was appointed director of the W.A.A.F. at the air ministry, with the rank of senior controller.

Originally formed in 1917, the Women's Royal Naval Service was revived in April, 1939, under the directorship of Mrs. Laughton Mathews, who holds rank equivalent to that of rear-admiral. Within six weeks of the outbreak of war so many applications had been received for membership that it was necessary to suspend recruiting. By comparison, however, with other women's organizations the Women's Royal Naval Service is a small, though carefully selected and highly trained force, at the close of 1939 the number of W.R.N.S. actually at work being still well under 5,000. Accepted candidates are posted to naval establishments within the four main commands, The Nore, Devonport, Portsmouth and Rosyth.

As in the Great War, the important field of activity afforded by the Women's Land Army attracted large numbers of recruits. Following on the inclusion of the Women's Land Army in the national service appeal in Jan. 1939, about 18,000 women had applied for enrolment by September. About half of these were enrolled by the beginning of the war. By Nov. 30, 20,000 out of 29,000 applicants were enrolled as members. Between the outbreak of war and the end of November some 3,500 volunteers received training at government expense, and 2,800 had been placed in agricultural employment through the land army organization for England and Wales. In Scotland 1,051 volunteers were enrolled by the end of December. (See also AIR RAID PRECAUTIONS; HOSPITALS; WELFARE AGENCIES, WAR, for information about women's work in nursing, civil defence, and voluntary services.) (D. A. C.)



1940
BRITANNICA
BOOK OF
THE YEAR



A Record of the March of Events of 1939

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THE YEAR

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THE EDITOR

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INTRODUCTION

THE third issue of the *Britannica Book of the Year*, covering the year 1939, was prepared during months of war. The manuscripts from abroad were delayed in transmission to this country: the hand of the censor opened envelopes even if it did not actually modify the text inside (and there was no physical evidence that it did); typed contributions in slow and cautious ships slipped by the grim U-boat and the secret mine to reach these peaceful shores. Embattled Europe affected in many ways the gathering together of this record of events of an exciting year even as it has affected the events themselves in every field of interest.

The days men live and the things they do make an interesting book any year. Each month moves to climax and to climax and to climax again. The characters appear to be good or bad and the events and achievements potentially good or bad as the reader judges them. The *Book of the Year* presents these characters and their activities, so far as possible, with photographic impartiality. This is not an easy thing to do. Editors and contributors know this and they work with a conscientious endeavour to do no more than to report what has happened.

The *Britannica Book of the Year* is released with concern that the tragedy of war colours so much of the record it bears, but with sincere hope too, that next year's volume will bring news of a world in which peace is found again, with honour to all peoples, a lasting peace, as it should be in a world where peace between men must be civilization's final justification.

The Editor.

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H.B.V.W.	H. B. VAN WESEP. Chief, Information Service, The Rockefeller Foundation, New York.	Rockefeller Foundation
H.C.Rd.	HENRY CLAY REED, Ph.D. Assistant Professor of History, University of Delaware.	Delaware
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H.E.A.C.	H. E. A. CONDON. Assistant Principal Clerk, Statistics and Intelligence, Inland Revenue, London.	Income Tax (in part)
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H.G.Mo.	HAROLD G. MOULTON, Ph.D., LL.D. President of the Brookings Institution, Washington, D. C.	Brookings Institution
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H.H.A.	HENRY H. ARNOLD. Chief of the Air Corps, War Department, Washington, D. C.	Air Forces (in part)
H.G.K.	HENRY G. KNIGHT. Chief, Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture.	Chemistry and Engineer- ing, Agricultural, U. S. Bureau of
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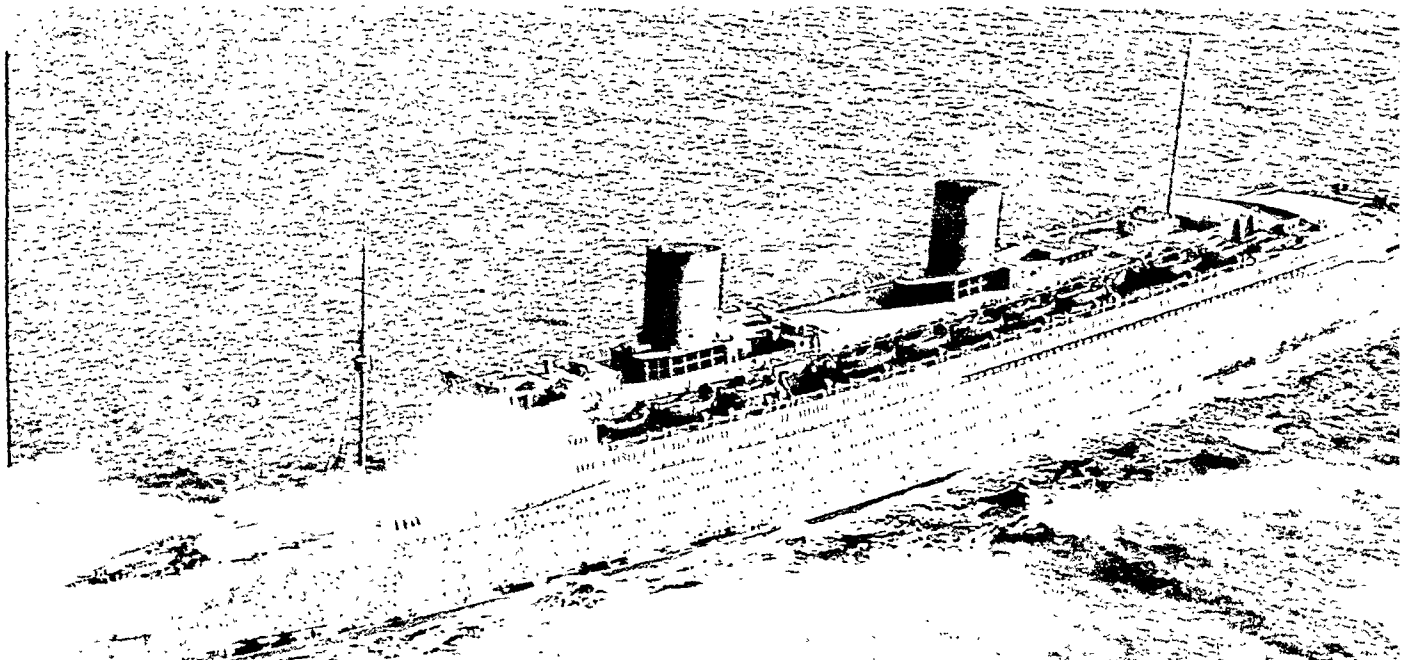
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N.T.	NORMAN THOMAS, A.B., B.D., Litt.D. Socialist presidential candidate, 1936.	Coinage
N.T.R.	NELLIE TAYLOR ROSS. Director of the United States Mint.	Young Men's Christian Association
O.E.P.	OWEN E. PENCE, A.M. Director, Bureau of Records, Studies and Trends of the National Council, Young Men's Christian Association of the United States, New York.	North Dakota
O.G.L.	ORIN GRANT LIBBY, M.L., Ph.D. Professor of American History, University of North Dakota, Grand Forks.	Democratic Party Republican Party, etc.
O.McK.	OLIVER MCKEE JR., B.A. Washington correspondent, <i>Boston Evening Transcript</i> , Washington.	Cleveland Ohio
P.By.	PAUL BELLAMY, A.B. Editor, <i>Cleveland Plain Dealer</i> , Cleveland, Ohio.	Serum Therapy
P.C.B.	PAUL CANFIELD BARTON, M.D. Medical Consultant, Council on Pharmacy and Chemistry of the American Medical Association, Chicago.	Foreign Investments in the United States
P.D.D.	PAUL D. DICKENS, A.B., Ph.D. Economic Analyst, Bureau of Foreign and Domestic Commerce, U. S. A.	Heart and Heart Diseases
P.D.W.	PAUL D. WHITE, M.D. Lecturer on Medicine, Harvard University Medical School, Boston, Mass.	Infantile Paralysis
P.DeK.	PAUL DE KRUIF, M.D. Science Writer and Bacteriologist. Author of <i>Microbe Hunters</i> ; etc.	Trailer Travel
P.E.	PAUL EDWARDS. Editor, <i>Trailer Topics Magazine</i> .	Marketing
P.H.N.	PAUL H. NYSTROM, Ph.B., Ph.M., Ph.D. Professor of Marketing, Columbia University, New York.	Oregon
P.H.P.	PHILIP H. PARRISH. Editorial writer, <i>The Oregonian</i> , Portland, Oregon.	Bank for International Settlements
P.Jn.	PER JACOBSSON. Economist of the Bank for International Settlements. Basle, Switzerland.	Retail Sales
P.J.R.	PHILIP J. REILLY. Director, Retail Research Association and Associated Merchandising Corporation, New York.	Chemotherapy
P.N.L.	P. N. LEECH, M.D. Director of the Division of Foods, Drugs and Physical Therapy of the American Medical Association.	Dance (<i>in part</i>)
P.Pa.	PATRICIA PARMELEE, Chairman, New School Course Committee, Folk Festival Council. Associate Editor, <i>Educational Dance</i> .	Turkey (<i>in part</i>)
P.P.G.	PHILIP P. GRAVES. On Foreign Department of <i>The London Times</i> . Times correspondent in Turkey 1908-14 and 1919-22. Author of <i>The Question of the Straits</i> ; etc.	National Academy of Sciences
P.S.B.	PAUL S. BROCKETT. Executive Secretary, National Academy of Sciences.	Gynaecology and Obstetrics
P.T.	PAUL TITUS, M.D. Secretary, Treasurer, and Director of the American Board of Obstetrics and Gynecology. President, American Association of Obstetricians, Gynecologists and Abdominal Surgeons.	Northwest Territories
R.A.G.	R. A. GIBSON. Deputy Commissioner, Northwest Territories.	Rural Electrification
R.B.C.	ROBERT B. CRAIG. Assistant Administrator, Rural Electrification Administration, U.S. Department of Agriculture, Washington, D.C.	Income Tax (<i>in part</i>)
R.Bi.	ROY BLOUGH. Director of Tax Research, U. S. Treasury Department, Washington.	American Citizens Abroad
R.B.S.	RUTH B. SHIPLEY. Chief of the Passport Division of the Department of State.	Telegraphy
R.B.W.	R. B. WHITE. President, The Western Union Telegraph Company, New York.	Los Angeles
R.D.Hu.	ROCKWELL D. HUNT, A.M., Ph.D., LL.D., Litt.D. Dean of the Graduate School and Professor of Economics, University of Southern California, Los Angeles.	Baptist Church
R.E.E.H.	REUBEN E. E. HARKNESS, B.D., Ph.D. President of the American Baptist Historical Society.	Polo
R.F.K.	ROBERT F. KELLEY. Sports Writer, <i>The New York Times</i> .	Rowing (<i>in part</i>)
R.Fs.	ROBERT FOSS. Editor, University of Wisconsin News Bureau, Madison, Wisconsin.	Wisconsin, University of
R.G.Ha.	ROSWELL GRAY HAM, Ph.D., LL.D. President of Mount Holyoke College, South Hadley, Mass.	Mount Holyoke College
R.G.Hu.	RAY G. HULBURT, D.O. Editor, <i>The Journal of the American Osteopathic Association</i> .	Osteopathy
R.Git.	ROY GITTINGER, Ph.D., LL.D. Dean of Administration and Professor of English History, University of Oklahoma, Norman.	Oklahoma
R.G.L.	R. G. LELAND, M.D. Director of Bureau of Medical Economics, American Medical Association, Chicago.	Socialized Medicine
R.G.M.	R. G. MACDONALD. Vice-President, Technical Association of the Pulp and Paper Industry.	Paper and Pulp Industry
R.G.S.	ROBERT G. SPROUL, LL.D. President, University of California.	California, University of
R.H.F.	REGINALD H. FIEDLER. Chief, Division of Fishery Industries, U. S. Bureau of Fisheries.	Fisheries
R.Hs.	RALPH HAYES, B.A. Executive Director, New York Community Trust.	Community Trusts
R.H.Sh.	ROBERT HALE SHIELDS, A.M. Assistant in History, University of California, Berkeley.	California (<i>in part</i>) Spain (<i>in part</i>) Argentina (<i>in part</i>), etc.
R.Is.	RAPHAEL ISAACS, M.D. Associate Professor of Internal Medicine, University of Michigan Medical School.	Anaemia
R.J.K.	RAYMOND J. KELLY, National Commander, The American Legion.	American Legion
R.Kn.	ROLF KALTENBORN. Columbia Broadcasting System Producer.	Broadcasting (<i>in part</i>)
R.L.C.	RUSSELL L. CECIL, M.D. Professor of Clinical Medicine, Cornell University Medical School, New York.	Pneumonia
R.L.Fy.	ROSS LEE FINNEY. American Composer. Pupil of Boulanger, Berg, Roger Sessions, and G. Francesco Malipiero. 1938 Pulitzer Scholarship, Guggenheim Fellowship. Professor of Music, Smith College, Northampton, Mass.	Music
R.L.W.	RAY LYMAN WILBUR, A.M., M.D., LL.D., Sc.D. President, Stanford University, California.	Stanford University
R.Ms.	RONALD MATTHEWS. On the foreign staff of the <i>London Daily Herald</i> ; writer on European affairs.	Belgium (<i>in part</i>)
Ro.St.	ROBERT STEWART, B.S., Ph.D. Dean of College of Agriculture, University of Nevada, Reno.	Floods and Flood Control (<i>in part</i>)
Ro.Sto.	ROBERT STOKES. Secretary, Press and Publications Board, Church Assembly, London. Editor of the Official Year Book of the Church of England.	Church of England
R.P.Br.	RALPH P. BIEHER. Associate Professor of History, Washington University, St. Louis, Missouri.	Missouri
R.P.Bs.	ROBERT PRESTON BROOKS, Ph.D. Dean, School of Commerce, University of Georgia; Author of <i>A History of Georgia</i> .	Georgia
R.R.G.	ROY R. GRINKER, M.D. Chairman, Neuro-psychiatric Department, Michael Reese Hospital, Chicago.	Nervous System
R.R.N.	ROBERT R. NATHAN. Chief of National Income Division, Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce, Washington.	National Debts National Income, etc.
R.R.P.	RAYE R. PLATT. Secretary, American Geographical Society, New York.	American Geographical Society

R.R.W.	RUSSELL R. WAESCHE. Rear Admiral, Commandant, U. S. Coast Guard.	Coast Guard, U.S., etc.
R.S.K.	R. S. KENNEDY, B.Sc. Editor-in-Chief, <i>Family Herald and Weekly Star</i> , Montreal, Canada.	Canadian Literature
R.SI.	ROCK SLEYSER. President, American Medical Association. Director of Milwaukee Sanitarium, Wauwatosa, Wis.	American Medical Association
R.So.	RENZO SERENO, LL.D., Ph.D. Sometime Fellow of the Institute of International Education. Research Associate, Department of Political Science, University of Chicago.	Italy
R.W.Be.	RICHARD W. BECKMAN. Director of Publicity, Iowa State College, Ames, Iowa.	Iowa State College
R.W.F.	RALPH WYLIE FREY, B.S. Senior Chemist, hide, tanning materials, and leather investigations, Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, Washington.	Leather (in part)
R.W.H.	RALPH W. HASKINS, M.A. University of California, Berkeley, California.	Venezuela (in part)
S.B.F.	SIDNEY B. FAY, Ph.D., L.H.D. Professor of History, Harvard University and Radcliffe College.	Germany, etc.
S.B.Wi.	S. B. WILLIAMS, Litt.B., E.E. Editor, <i>Electrical World</i> .	Electrical Industries
S.C.Ha.	SIDNEY CHANDLER HAYWARD, B.S., M.A. Secretary of Dartmouth College.	Dartmouth College
S.C.Ro.	SARAH C. ROBERT. President General, National Society Daughters of the American Revolution.	Daughters of the American Revolution
S.D.McC.	S. D. MCCOMB. Manager, Marine Office of America, New York.	Insurance, Marine
S.Dn.	STEPHEN DUGGAN, Ph.D., Litt.D., LL.D. Director, Institute of International Education, New York.	Education (in part)
S.G.H.	SAMUEL G. HIBBEN, B.Sc., Hon.E.E. Director of Applied Lighting, Westinghouse Lamp Division, Westinghouse Electric and Manufacturing Company.	Electric Lighting
S.J.McK.	S. JUSTUS MCKINLEY, Ph.D. Professor of History and Social Science, Emerson College, Boston.	Boston
S.J.W.	SIDNEY JOHN WORSLEY, D.S.O., M.C., T.D. Academic Registrar, University of London, since 1930, and Acting Principal, 1936-37.	London University
S.Lea.	STEPHEN LEACOCK, B.A., Ph.D., Litt.D., LL.D., D.C.L. Professor Emeritus, McGill University, Montreal.	Canada (in part)
S.McC.C.	SAMUEL MCCREA CAVERT, D.D. General Secretary, The Federal Council of the Churches of Christ in America.	Federal Council of the Churches of Christ
S.McC.L.	SAMUEL MCCUNE LINDSAY, Ph.D., LL.D. Professor Emeritus of Social Legislation, Columbia University, New York.	International Labour Organization
S.M.Ha.	SHELBY M. HARRISON, LL.D. General Director, Russell Sage Foundation.	Donations and Bequests Russell Sage Foundation
S.O.D.	SAIDIE ORR DUNBAR. President of the General Federation of Women's Clubs.	Women's Clubs, General Federation of
S.O.R.	SAMUEL O. RICE, Ph.B. Formerly Director, Educational Department of the Investment Bankers Association, 1925-36. Formerly, Editor of <i>Copper's Farmer</i> and of the weekly <i>Kansas City Star</i> .	Cereals
S.P.J.	S. PAUL JOHNSTON, B.S., Formerly Editor of <i>Aviation</i> .	Livestock, etc.
S.R.S.	SAMUEL RAY SCHOLES, Ph.D. Professor of Glass Technology, New York State College of Ceramics, Alfred University, Alfred, New York.	Air Forces (in part)
S.S.H.	S. S. HUEBNER, Ph.D., Sc.D. President, American College of Life Underwriters. Professor of Insurance and Commerce, Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia.	Glass
S.SI.	SIMON SEGAL. Member of the staff of the International Labour Office, Geneva, Switzerland. Author of <i>The New Poland and the Jews</i> ; etc.	Stock Exchanges
S.So.	SAMUEL SOSKIN, M.D. Assistant Professor of Physiology, School of Medicine of the Division of Biological Sciences, University of Chicago.	Stocks
S.Sp.	SIGMUND SPAETH, Ph.D. President, National Association for American Composers and Conductors, New York.	Poland (in part)
St.S.	STEN SELANDER. Literary and dramatic critic for the <i>Svensk Dagbladet</i> .	Warsaw
S.Yak.	SERGIUS YAKOBSON. Lecturer in Russian History, University of London, School of Slavonic and East European Studies, and Librarian.	Endocrinology
T.Be.	THOMAS BEACH. Principal, Kilburn Polytechnic, London.	Music, Popular
T.Bs.	TANCRED BORENIUS, Ph.D., D.Lit., F.S.A. Secretary, Finnish Delegation to Economic Conference, London, 1933. Professor of History of Art, University College, London since 1922.	Scandinavian Literature
T.C.B.	THEODORE C. BLEGEN, M.A., Ph.D., L.H.D. Formerly Secretary and Superintendent, Minnesota Historical Society.	U.S.S.R. (in part)
T.C.Pe.	THEODORE C. PEASE, Ph.B., Ph.D. Professor of History, University of Illinois, Urbana.	Education, Vocational (in part)
T.D.S.	TOM DOUGLAS SPIES, M.D. Associate Professor of Medicine, University of Cincinnati College of Medicine.	Finland (in part)
T.H.MacD.	THOMAS H. MACDONALD, B.C.E. Commissioner, Public Roads Administration, Federal Works Agency.	Minnesota
T.Hu.	TED HUSING. Sports announcer for the Columbia Broadcasting System, New York.	Illinois
T.J.D.	THOMAS J. DEEGAN. President, The Fifth Avenue Board of Promotion, Inc., New York.	Pellagra
T.P.	THOMAS PARRAN, M.D. Surgeon General, U. S. Public Health Service, Washington.	Roads and Highways
T.Pk.	THOMAS PARK, S.B., Ph.D. Assistant Professor of Zoology, the University of Chicago. Editor of <i>Ecology</i> .	Golf
T.S.G.	THOMAS S. GATES, LL.D. President, University of Pennsylvania, Philadelphia.	Air Races
V.Pi.	VIVIAN PIERCE. Director, American League to Abolish Capital Punishment.	Automobile Racing, etc.
V.R.	VIOLA RIPLEY, B.Sc. Assistant Lecturer in Biology, Huddersfield Technical College, Huddersfield, England, 1926-28.	Veneral Disease
V.S.	VILHJALMUR STEFANSSON, A.M., Ph.D., LL.D. Commander of the Canadian Arctic Expedition under the auspices of the American Museum of Natural History and the Geological Survey of Canada, 1908-12, etc.	Zoology
W.A.Br.	WILLIAM ADAMS BROWN, M.A., Ph.D., D.D., S.T.D. Theologian. Editor, <i>International Religious Library</i> . Member Editorial Board, <i>Religion in Life</i> .	Pennsylvania, University of
W.A.Ha.	WILLIAM A. HAMOR. Assistant Director of Mellon Institute of Industrial Research.	Capital Punishment
W.A.J.	WALTER A. JESSUP, M.A., Ph.D., LL.D., Litt.D. President, Carnegie Foundation for the Advancement of Teaching, New York.	Zoological Gardens
Wa.Wal.	WALTMAN WALTERS, M.D., Sc.D. Professor of Surgery, University of Minnesota Graduate School of Medicine.	Exploration and Discovery
W.B.Pu.	WILLIAM BARROW PUGH, D.D. Stated Clerk, The Presbyterian Church in the United States of America.	Church Reunion
W.C.	WILLIAM CROCKER, A.B., A.M., Ph.D. Director, Boyce Thompson Institute for Plant Research, Inc., Yonkers, N.Y.	Religion
W.D.L.	WILLIAM DRAPER LEWIS, LL.B., Ph.D., Director, American Law Institute, Philadelphia, Pennsylvania.	Industrial Research, etc.
W.D.Mn.	WILLARD D. MORGAN, B.A. Writer, Photographer, Publisher. Founder and partner of firm, Morgan and Lester, New York. Associate editor of <i>U.S. Camera Magazine</i> .	Universities and Colleges (in part)
		Surgery
		Presbyterian Church
		Botanical Gardens
		Botany
		American Law Institute
		Photography, Miniature Camera

W.E.Ga.	W. E. GARRISON, Litt.D., B.D., Ph.D. Associate Professor of Church History, Disciples Divinity House and University of Chicago, Chicago.	Disciples of Christ
W.E.O.	WILLIAM E. OGILVIE. Press Relations, International Live Stock Exposition, Chicago.	Shows (in part)
W.E.Ss.	WAYNE EDSON STEVENS, M.A., D.Ph. Professor of History, Dartmouth College, Hanover, New Hampshire.	New Hampshire
W.F.B.	WALTER F. BOGNER. Architect. Associate Professor of Architecture, School of Design, Harvard University.	Architecture
W.F.Br.	WILLIAM F. BRAASCH, M.D. Mayo Clinic, Rochester, Minnesota. Professor of Urology, University of Minnesota Graduate School. Chairman, Editorial Committee, <i>Journal of Urology</i> .	Urology
W.G.Ca.	WALTER G. CAMPBELL, LL.B. Chief, Food and Drug Administration, U. S. Department of Agriculture, Washington.	Drugs and Drug Traffic (in part)
W.G.Cy.	W. GIBSON CAREY, Jr. President, Chamber of Commerce of the United States.	Chambers of Commerce
W.H.Ch.	WILLIAM HENRY CHAMBERLIN. Correspondent in France for <i>Christian Science Monitor</i> . Author of <i>Russian Iron Age; The Russian Revolution, 1917-1921; Japan Over Asia</i> .	China
W.H.G.	WALTON HARLOWE GREEVER, A.M., D.D., LL.D. Secretary of The United Lutheran Church in America, New York.	Japan, etc.
W.H.Wn.	W. H. WILLSON, B.Sc. (Econ.) Author of <i>Markets of the Empire; Empire Trade</i> .	Lutherans
W.J.Bt.	W. J. BRETT. Editor, <i>Fur Trade Review</i> , New York.	Great Britain and Northern Ireland, United Kingdom of (in part)
W.J.C.	WILLIAM J. CUNNINGHAM, A.M. Professor of Transportation, Harvard University, Graduate School of Business Administration, Boston.	Sweden (in part), etc.
W.J.He.	W. J. HEALY. Formerly Provincial Librarian of Manitoba, Canada.	Furs
W.Ju.	WILL JUDY. Editor of <i>Dog World</i> .	Railroads (in part)
W.L.Be.	WILLIAM L. BENEDICT, M.D. The Mayo Clinic, Rochester, Minn. Professor of Ophthalmology, University of Minnesota Graduate School.	Manitoba
W.L.Pi.	WARREN LEE PIERSON, LL.B. President, Export-Import Bank of Washington.	Shows (in part)
W.L.T.	W. L. TREADWAY, M.D. Assistant Surgeon General, U. S. Public Health Service, Washington.	Eye, Diseases of
W.Mc.M.	WHEELER MCMILLEN. Editor in Chief, <i>Farm Journal</i> and <i>Farmer's Wife</i> .	Export-Import Bank of Washington
W.P.C.	WILLIAM PITCHER CREAGER, C.E. Consulting Hydraulic Engineer. Author of <i>Engineering for Masonry Dams</i> , etc.	Intoxication, Alcoholic
W.Pr.	WALTER PRICHARD, M.A. Head of the Department of History, Louisiana State University, University, La. Editor, <i>Louisiana Historical Quarterly</i> .	Chemurgy
W.P.S.	WARREN P. SPENCER, M.D. Professor of Genetics, College of Wooster, Wooster, Ohio.	Dams
W.S.Ad.	WALTER S. ADAMS, A.M., D.Sc., LL.D. Director, Mount Wilson Observatory of the Carnegie Institution.	Louisiana
W.S.G.	WALTER S. GIFFORD, A.B., LL.D. President, American Telephone and Telegraph Company, New York.	Genetics
W.T.M.	WILLIAM T. MANNING, D.C.L., LL.D. Bishop of New York.	Telescopes
W.T.St.	W. TETLEY STEPHENSON, M.A. Cassel Reader in Transport at the London School of Economics and Political Science.	Telephone
W.W.B.	WILLARD W. BEATTY. Director of Education, Office of Indian Affairs, U. S. Department of the Interior, Washington.	Protestant Episcopal Church
W.Wh.	WALTER WHITE, B.A. Secretary, National Association for the Advancement of Colored People, New York.	Motor Transportation (in part)
X	ANONYMOUS.	Indians, American
		Lynchings

"QUEEN ELIZABETH," largest liner afloat, was secretly fitted out in Scotland during 1939 for her surprise maiden voyage across the Atlantic in March 1940
View (Wide World) shows her nearing New York



1941												
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- ## MAY
- 1 May Day. International Labour Festival.
 - 2 Ascension Day.
 - 5 Cinco de Mayo, Mexican holiday.
 - 7 Sinking of "Lusitania"; 25th anniversary.
 - 12 Whitsunday. Mother's Day, U. S. A.
 - 13 English Bank Holiday.
 - 13 Centenary, birth of Alphonse Daudet.
 - 17 Norwegian Independence Day.
 - 18 Peace Day.
 - 19 Trinity Sunday.
 - 23 Feast of Corpus Christi.
 - 24 Italy entered World War; 25th anniversary.
 - 24 Empire Day. Queen Victoria born, 1819.
 - 29 Admission of Rhode Island to Union; 150th anniversary.
 - 30 Memorial or Decoration Day, U.S.A.
 - 31 Union Day, South Africa; 30th anniversary.
- ## JUNE
- 2 Centenary, birth of Thomas Hardy.
 - 8 Accession of Carol II to throne of Rumania; 10th anniversary.

- 1 First anniversary, beginning of
European war.
2 Labor Day, U.S.A.
16 Mexican Independence Day.
17 Constitution Day.
23 Autumnal equinox.
23 American Legion national convention
opens in Boston.
26 Dominion Day, New Zealand.
27 Society of Jesus; 400th anniversary.

CALENDAR OF EVENTS, 1939

For elections, disasters, and assassinations of 1939, see under those headings in the text. For obituaries of prominent persons who died during 1939, see under the entry Obituaries.

JANUARY

1 Chiang Kai-shek ordered arrest of approximately 200 followers of Wang Ching-wei, former premier expelled from Chinese Gov't for attempted peace negotiations with Japan.

2 Frank Murphy succeeded Homer S. Cummings as U.S. attorney general.

Premier Daladier began "colonial solidarity" tour with visit to Ajaccio, Corsica.

3 Seventy-sixth U.S. Congress convened; report of Senate's committee on campaign expenditures charged use of WPA funds for political purposes in three States.

4 Adequate national defence and preservation of democracy against encroachments of authoritarian States urged by Roosevelt in message to Congress on state of the Union.

Cabinet of Fumimaro Konoye resigned; Baron Kiichiro Hiranuma named Japanese premier.

5 Deficit of \$3,326,000,000 for fiscal year 1940 estimated by Pres. Roosevelt in annual budget message to Congress.

Felix Frankfurter appointed associate justice of U.S. Supreme Court to succeed the late Benjamin N. Cardozo.

Spanish Gov't troops seized mountain chain in surprise offensive on Estremadura front; Insurgents captured Borjas Blancas in Catalonia.

6 Czech and Hungarian troops clashed near Munkacsvo on new Ruthenian frontier.

7 Thomas J. Mooney pardoned by Gov. Culbert Olson of California after 22 years' imprisonment for alleged implication in San Francisco bombing.

Roosevelt in Jackson Day dinner address pleaded for unity in Democratic Party and invited dissentient Democrats to join Republicans.

9 New Reich Chancellery dedicated by Adolf Hitler in Berlin.

10 Ambassadors Joseph P. Kennedy and William C. Bullitt warned joint congressional committee on military affairs of imminent European war.

11 Lincoln Ellsworth claimed 81,000 sq.mi. of newly-discovered land in Antarctica for U.S.A.

12 Chamberlain concluded two-day visit to Mussolini with "no new commitment, arrangement or agreement."

13 House of Representatives reduced relief deficiency appropriation from \$875,000,000 requested by Roosevelt to \$725,000,000; the Senate approved the reduction on January 27 by 47 to 46 vote.

14 British note to Japan protested against violation of Nine-Power treaty, but offered to negotiate modifications to pact.

15 Tarragona fell to Spanish Insurgents in steady drive of Gen. Franco's troops toward Barcelona.

16 Bombings in Manchester, Liverpool, Belfast, and London attributed to terrorists of outlawed Irish Republican Army.

17 U.S. Senate confirmed appointments of Felix Frankfurter as associate justice of Supreme Court and Frank Murphy as attorney-general.

19 Repeal of taxation immunity of public employees recommended by Pres. Roosevelt in message to Congress.

20 Hitler removed Dr. Hjalmar Schacht as president of Reichsbank and appointed Walther Funk to succeed him.

Homer Martin expelled 15 members of United Automobile Workers' executive board and seized files of union.

21 Field Marshal Goering invited George Rublee, director of Intergovernmental Committee on Refugees, to resume Jewish emigration conferences interrupted by dismissal of Dr. Hjalmar Schacht.

22 All officers of German army ordered to join the Reich Warrior League, political unit of the National Socialist party.

23 Martial law decreed in Barcelona as Insurgent

troops pushed to within 12mi. of Loyalist capital.

Harry L. Hopkins confirmed as Sec'y of Commerce by 58 to 27 vote of Senate after bitter debate on qualifications.

National health program, to cost \$850,000,000 annually, submitted by Pres. Roosevelt to Congress for study.

U.S. Army pursuit plane attained speed of 375 m.p.h.—fastest man has ever travelled—in power dive during test at Buffalo.

24 C.I.O. announced it would support Homer Martin's opponents in internal strife of United Automobile Workers' Union; Martin resigned from the C.I.O. executive board January 25.

25 Loyalist Gov't fled to Gerona and Figueras as Insurgent troops surrounded Barcelona and cut off escape of refugees.

26 Barcelona surrendered to Gen. Franco's troops without struggle.

French Gov't refused to accept appointment of Masayuki Tani as Japanese Ambassador to France.

27 Pres. Roosevelt revealed he had authorized purchase by France of large number of most modern American fighting planes; Senate military affairs committee requested explanation of presence of French aviation representative aboard latest-type light bomber which crashed January 23.

28 The democracies would unite in resisting any "demand to dominate the world by force," asserted Prime Minister Chamberlain in address at Birmingham.

Lord Chatfield succeeded Sir Thomas Inskip as British minister for co-ordination of defence; Inskip became Dominions sec'y and Sir Reginald Dorman-Smith minister of agriculture.

29 Thousands of Spanish refugees crossed French border in mass trek as Franco's army marched through northern Catalonia with scant resistance.

30 Germany "wants peace and quiet," but is determined to regain colonial possessions, Hitler declared in Reichstag speech; he denied religious persecution in Germany, criti-

cized "warmongers" in the democracies, especially the U.S.A., and pledged armed help to Italy if latter were to become involved in war "regardless of its motives."

Martin T. Manton, senior judge of U.S. Circuit Court of Appeals, second district, resigned after charges of accepting money from litigants in his court; he was later indicted (March 2).

U.S. Supreme Court dismissed suit of 14 private utilities to enjoin competitive activities of Tennessee Valley Authority.

31 America's frontier is in France, Pres. Roosevelt reportedly told Senate military affairs committee; he outlined practical measures by which U.S.A. would help France and Great Britain in war.

FEBRUARY

1 Roosevelt's declaration of support for European democracies provoked bitter debate in Senate; German and Italian newspapers attacked statement as war agitation.

2 U.S. State Dept. announced British waiver of agreement on reciprocal schedule for transatlantic air service, thus permitting American lines to begin flights at any time.

Premier Paul-Henri Spaak of Belgium beaten by mob of war veterans who protested his appointment to academy of medicine of physician convicted as German sympathizer during World War.

U.S.S.R. severed diplomatic relations with Hungary after latter nation had joined anti-Comintern pact.

3 Roosevelt denied published reports that he had declared American frontier to be in France; he said U.S.A. is against any foreign alliances and favours disarmament, share in world trade for all nations, and "political, economic, and social independence" of every State.

Dies committee investigation on un-American activities extended for year by House of Representatives, 344 to 35.

William Phillips, U.S. Ambassador to Italy, protested invectives in Fascist press against Pres. Roosevelt.

4 Renewed frontier clashes on Soviet-Japanese border

FEBRUARY—Continued

near Manchuli reported by Manchoukuoan Gov't.

TVA agreed to purchase properties of Commonwealth and Southern Corporation in Tennessee for \$78,000,000.

5 France opened border at Perthus to retreating Loyalist army, estimated at 200,000 men.

6 Dragisha Cvetković sworn in as Yugoslav premier to succeed Milan Stoyadinović, who resigned February 4.

U.S. Senate rejected appointment of Floyd H. Roberts as district judge of Virginia, 72 to 9; the action touched off a bitter verbal battle between Pres. Roosevelt and Sen. Carter Glass.

Franco demanded unconditional surrender of Loyalists with no guarantee of plebiscite or of amnesty for Gov't leaders.

7 Foreign Minister Alvarez del Vayo announced Loyalists would continue resistance to Insurgents in central and south-eastern Spain.

Palestine conference opened in London; Prime Minister Chamberlain pleaded for reconciliation between Jewish and Arab delegations.

Roosevelt requested additional \$150,000,000 to restore cut in original \$875,000,000 WPA deficiency appropriation.

U.S.S.R. and Italy resumed commercial relations severed since 1937.

8 Gen. José Miaja, commander of Loyalist defenders of Madrid, asked French Gov't for a safe conduct.

9 Oswaldo Aranha, Brazilian foreign minister, arrived in U.S.A. on "good-will" tour.

Island of Minorca surrendered to Spanish Insurgents after peace negotiations aboard British cruiser, which later evacuated 450 Loyalists.

Alex Henshaw, British flyer, broke all speed records from England to Cape Town, making round trip in 4 days, 10 hours, 16 minutes.

Taxation of all Federal, State, and municipal employees voted

by House of Representatives, 269 to 103.

Premier Paul-Henri Spaak of Belgium resigned.

Sec'y of Treasury Morgenthau declared U.S. stabilization fund had made net profit of \$12,000,000 since 1934.

10 Pope Pius XI died at Vatican City; he was buried in the crypt of St. Peter's February 14.

Japanese occupation of Hainan island imperilled British and French defences of possessions in Far East.

11 Loyalist cabinet met in Valencia to reorganize administration in central Spain; Gov't moved to Madrid February 12.

12 Nazi plan for systematic emigration of German Jews disclosed by George Rublee at meeting of Intergovernmental Committee on Refugees in London; proposal envisaged permitting Jews to earn living while waiting to emigrate.

13 Justice Louis D. Brandeis retired from U.S. Supreme Court.

14 French military mission in U.S.A. announced purchase of 500 additional U.S. war planes.

Germany's first 35,000-ton battleship, the "Bismarck," launched at Hamburg.

15 House of Representatives voted 367 to 15 to add 3,000 planes to U.S. air force; Senate increased total number to 6,000 on March 7.

Great Britain announced it would build two more battleships, bringing total under construction to 9.

Bela Imredy, anti-Semitic premier of Hungary, resigned after admitting truth of charges that his great-grandfather was a Jew; Count Paul Teleki formed new cabinet February 16.

16 Wayne C. Taylor resigned as Assistant Sec'y of Treasury after reported rift over Gov't policy of extending credit to foreign nations.

17 No new taxes contemplated, said Pres. Roosevelt in press conference en route to

inspect fleet manoeuvres in Caribbean.

George Rublee resigned as director of Intergovernmental Committee on Refugees.

18 Golden Gate International Exposition opened at San Francisco.

19 Peruvian troops speedily subdued revolt during absence of Pres. Benavides; Gen. Antonio Rodríguez, leader of the attempted coup, was slain.

20 U.S. Navy began war games in Atlantic and Caribbean.

Mass meeting of 22,000 members of German-American Bund in New York city precipitated disorders and drew large crowds of anti-Nazis to scene.

21 Legal borrowing limit of British Gov't extended to £800,000,000 by House of Commons to pay for expenses of rearmament in 1939-40.

Existence of U.S. Export-Import Bank extended to June 30, 1941 by House of Representatives, 280 to 77.

Japanese planes bombed British railroad station in Hongkong, killing Indian policeman and wounding others.

"King George V," new British 35,000-ton capital ship, launched by King George VI at Newcastle.

22 Unidentified ship radioed S.O.S. that it had been torpedoed by unknown submarine south of Azores; search for sinking vessel proved fruitless.

23 Bill to fortify Guam defeated by House of Representatives, 205 to 168.

24 Sec'y of Commerce Hopkins said in Des Moines address that New Deal had shifted emphasis of its economic program from reform to recovery and was determined to encourage private business and capital.

Hungarian Nazi organization dissolved and leaders jailed.

25 Pres. Roosevelt requested John L. Lewis and William Green to negotiate "peace with honour" between C.I.O. and A.F. of L.; Green accepted proposal same day; Lewis on February 28.

James J. Hines found guilty on 13 charges of participation in "numbers" racket; he was sentenced to serve four to eight years in prison March 23.

Polish students attacked German embassy at Warsaw but cheered Count Galeazzo Ciano, Italian foreign minister on visit of State.

Italian citizens began mass repatriation from France.

26 British Gov't announced to Arab-Jewish Conference in London that it proposed to relinquish mandate over Palestine and set up independent State; Jewish delegates rejected plan next day.

27 France and Great Britain granted unconditional recognition to Franco's Gov't.

Sit-down strikes outlawed by decision of U.S. Supreme Court, 5 to 2.

28 Manuel Azaña resigned as president of the Spanish republic.

MARCH

1 U.S. Air Force consolidated under direction of Maj. Gen. Henry H. Arnold.

2 Eugenio Cardinal Pacelli elected pope on second day of cardinals' conclave; he selected title of Pius XII.

Marshal Philippe Pétain appointed French Ambassador to Franco's Gov't.

3 Pius XII expressed "hope and appeal for peace" in first public address.

Gen. Robert E. Wood appointed adviser to Sec'y of Commerce Hopkins.

4 Democratic form of government extolled by Pres. Roosevelt and Chief Justice Hughes in addresses celebrating 150th anniversary of U.S. Congress.

The pictures on this page are, left to right:

RUBLEE.....	Jan. 21
MANTON.....	Jan. 30
ARANHA.....	Feb. 9
IMREDY.....	Feb. 15
HUGHES.....	Mar. 4



MARCH—Continued

Laurence A. Steinhardt appointed U.S. Ambassador to Russia.

Japan claimed capture of Haichow in new intensive campaign against guerrillas in northern China.

5 Juan Negrin ousted as premier of Republican Spain by Gen. Segismundo Casado, army chief, who formed national defence council; revolt against Loyalists at Cartagena naval base suppressed.

6 Gen. José Miaja became president of Madrid's defence council; Communists began series of revolts against new Gov't.

Japan announced six-year naval building program to cost 1,700,000,000 yen and give nation parity with U.S. and Britain.

7 C.I.O. proposed formation of a single federation of American labour.

Armand Calinescu appointed premier of Rumania after death of Miron Cristea the preceding day.

United Automobile Workers' union, with Homer Martin as president, formally seceded from the C.I.O.

Spanish Republican fleet of 11 vessels voluntarily interned at Bizerta, French naval base in Tunisia.

Mohandas Gandhi ended four-day fast in protest against autocracy of Thakore Saheb of Rajkot; British viceroy agreed to submit dispute to Chief Justice of India.

8 Nineteen divisions of 300,000 British troops would be sent to France in event of war, Leslie Hore-Belisha announced to House of Commons.

Great Britain granted £5,000,000 credit to China to support the Chinese dollar.

The pictures on this page are, left to right:

MIAJA.....Mar. 6
GANDHI.....Mar. 7
VICTOR EMMANUEL.....Mar. 23
MORGENTHAU.....Mar. 24
LEBRUN.....Apr. 5

Cochran-Warren reorganization bill passed by House of Representatives, 246 to 153; Senate approved, 63 to 23, on March 22.

Palestine Conference meetings suspended by order of British Gov't.

9 U.S.-Brazilian commercial agreements concluded at Washington; terms provided for extension of more than \$100,000,000 in credit to Brazil.

10 Premier Josef Tiso of Slovakia ousted by Czech Gov't; he addressed appeal to Hitler for assistance in proclaiming complete independence of Slovakia from Prague.

Stalin, in opening address before 18th Communist Party congress in Moscow, accused democracies of attempting to provoke Soviet-German war.

11 Dr. Karl Sidor named premier of Slovakia as German troops massed on border near Bratislava.

Luigi Cardinal Maglione appointed papal secretary of state by Pius XII.

12 Pope Pius XII crowned on balcony of St. Peter's.

13 German ultimatum to Prague reputedly demanded division of nation into three "independent" states.

14 Republic of Czecho-Slovakia collapsed as Slovakia and Ruthenia declared independence; Hungarian troops began occupation of Ruthenia after skirmishes with Czech troops; Josef Tiso reinstated as Slovakian premier.

15 Dr. Emil Hacha "requested" German protectorate over Czecho-Slovakia, which nation Hitler thereupon proclaimed non-existent; Hitler, preceded by German troops, entered Prague.

16 Hitler proclaimed protectorate over Bohemia and Moravia and assumed protection of Slovakia at invitation of Josef Tiso; Hungary formally announced annexation of Ruthenia.

17 British ambassador to Berlin recalled for consultation; Chamberlain condemned Germany's disregard of written pledges.

U.S.A. refused recognition of German protectorates over Bohemia, Moravia, and Slovakia; note of State Dep't called occupation an act of "wanton lawlessness and arbitrary force."

18 Dictatorial powers to rule by decree granted Premier Daladier by Chamber of Deputies; French ambassador to Berlin ordered to return to Paris.

Increase of 25% on German import duties announced by U.S. Treasury.

Germany rejected French and British protests over annexation of Czecho-Slovakia; Nazi foreign office recalled ambassador to London; Baron Constantin von Neurath named Reich protector of Bohemia and Moravia.

19 Soviet note to Berlin declared seizure of Czecho-Slovakia illegal and withheld Russian recognition.

Berlin welcomed Hitler as "aggrandizer of the Reich" upon his return from tour of Bohemia.

20 British Gov't announced that it was "in direct consultation with other governments" to form anti-Fascist bloc.

William O. Douglas nominated to Supreme Court by Pres. Roosevelt; he was confirmed by Senate April 4.

Pres. Roosevelt abandoned request for increase in limitation of \$45,000,000,000 on U.S. public debt, but asked Congress to increase \$30,000,000,000 limit on amount of bonds that may be outstanding at one time.

21 Italian Fascist Grand Council voted approval of Germany's territorial seizures and warned that an anti-Fascist coalition of democracies would "herald war."

Pres. Albert Lebrun of France arrived in London on state visit; both he and King George VI reaffirmed Franco-British identity of interests.

22 Lithuania yielded Memel to German Empire; Reich agreed in formal treaty to give Lithuania access to city as free port.

23 Hitler made triumphal entry into Memel.

Hungarian troops invaded eastern Slovakia shortly after treaty was signed at Berlin in which Germany guaranteed "political independence and integrity" of Slovakia for 25 years.

Reich concluded five-year trade treaty with Rumania.

King Victor Emmanuel opened new Italian Chamber of Fasces and Corporations with speech in which he avoided direct mention of French-Italian controversies and emphasized Rome's desire for peace.

24 Postponement of increase in U.S. social security taxes and reduction of fund's reserve recommended by Sec'y of Treasury Morgenthau.

Earl Durand, Wyoming mountaineer, shot self after eight-day man hunt during which he killed four men.

House of Representatives tabled resolution which sought to impeach Sec'y of Labor Frances Perkins.

25 Hitler declared "the German people stand shoulder to shoulder with the battle-proved Italian nation."

26 Mussolini suggested that France initiate discussions to solve "problems of Tunisia, Jibuti, and the Suez Canal."

27 "Yankee Clipper," with 21 aboard, landed in Azores on first lap of inspection flight for regular transatlantic service.

Investigation of WPA ordered by House of Representatives, 352 to 27.

Nan-chang captured by Japanese troops.

28 Madrid surrendered to Franco's troops without resistance after 29-month siege.

Reduction of \$250,000,000 in payments for farm price parity in 1940 voted by House of Representatives.

29 Spanish civil war ended after 32 months of fighting; Loyalists surrendered all remaining territory in south-eastern Spain.

Premier Daladier, in international broadcast, declared negotiation with Italy was impossible without knowing nature and extent of Italian demands; he reiterated his statement that



MARCH—Continued

France would yield neither land nor rights.

Prime Minister Chamberlain announced in House of Commons that British Territorial Army would be increased to 340,000 by voluntary enlistment.

30 Nazi conspiracy to seize Patagonia charged by Argentina after revelation of secret document reputedly signed by counsellor of German embassy in Buenos Aires.

31 Immediate military assistance to Poland in event of aggression pledged by Great Britain and France; British action marked historic departure from policy of non-interference in eastern European affairs.

Japan annexed Spratly islands in South China Sea, formally claimed by France in 1933.

House of Representatives approved additional appropriation of \$100,000,000 for WPA, 290 to 110.

APRIL

1 U.S.A. recognized Gov't of Gen. Franco and lifted arms embargo against Spain.

320,000 miners in Appalachian soft coal fields quit work after expiration of contracts between operators and United Mine Workers' union.

Germany's readiness to fight to avoid encirclement by allies of Britain and France stressed by Hitler in speech at Wilhelms-haven after launching of battleship "Admiral von Tirpitz."

2 Liberal and Catholic parties gained heavily in Belgian national election at expense of Socialists and Rexists.

3 Triple damages of \$711,932 against union affiliate of C.I.O. awarded to hosiery company in Philadelphia.

Prime Minister Chamberlain invited "co-operation of any country, whatever its system of government, in resistance to aggression."

Col. Josef Beck, Polish foreign minister, arrived in London to discuss military alliance with Great Britain.

German budget for 1939-40 included 1,500,000,000 marks for subsidy of exports.

Fred H. Brown confirmed by Senate as U.S. Controller General.

4 Feisal II, 3 years old, became king of Iraq under regency following death of his father, Ghazi I, in motor car accident.

Slovakia yielded approximately 385 sq.mi. along eastern frontier to Hungary.

Earl Stanhope, First Lord of the Admiralty, declared that orders had been issued to man the British fleet's anti-aircraft guns; the remark was later suppressed by order of Prime Minister Chamberlain, but appeared in some newspapers.

U.S. aircraft carrier "Wasp" launched at Quincy, Mass.

5 Italian and German army chiefs conferred at Innsbruck as Italy prepared to occupy Albania.

Albert Lebrun re-elected president of France by National Assembly.

6 Joint administration of Canton and Enderbury islands established by Great Britain and U.S.A.

7 Italy invaded Albania; Albanian troops resisted for brief time in Durazzo and Valona.

Thomas J. Pendergast, political "boss" of Kansas City, indicted on charges of evading income tax; he pleaded guilty and was sentenced on May 22 to 15 months in prison.

Spain announced adherence to anti-Comintern pact.

8 Italian troops entered Tirana; King Zog fled to Greece.

Sec'y of State Hull, in note approved by Pres. Roosevelt, denounced Italian invasion of Albania as "threat to the peace of the world."

Chinese troops recaptured Koaan, west of Nan-chang, and claimed wide advances in campaign to retake Canton.

9 Easter sermon of Pope Pius XII deplored violation of international pacts but urged justice in distribution of world's goods among nations.

Occupation of Albania completed by Italian troops; Great Britain reputedly warned Rome against invasion of Corfu.

10 Netherlands increased border battalions to full wartime strength.

11 Bulgaria ordered dissolution of Ratnizi, Nazi party, after exposure of reported plot to overthrow Gov't.

Pres. Roosevelt inferred in press conference that U.S.A. would become involved if general European war broke out.

U.S. Senate passed WPA deficiency appropriation of \$100,000,000, despite Roosevelt's appeal for \$50,000,000 more.

12 Albanian assembly offered crown to King Victor Emmanuel of Italy but voted to retain semblance of autonomy.

Germany claimed 230,000 sq. mi. in Antarctica.

Plan to stabilize U.S. stocks in event of war discussed by bankers at meeting in New York city.

13 Guarantee of armed assistance to Greece and Rumania pledged simultaneously by Great Britain and France.

14 U.S.A. would meet attack on any of the Americas with all its strength, declared Pres. Roosevelt in speech before Pan American Union.

15 In identical notes to Hitler and Mussolini, Pres. Roosevelt asked for assurance that neither would invade 31 independent nations of Europe and Asia for at least 10 years.

U.S. Fleet ordered to return to Pacific.

British note to Russia reputedly asked Soviet assistance for Rumania and Poland in case latter nations were attacked.

16 U.S.S.R. proposed formation of triple defensive alliance by Great Britain, France, and Russia, according to correspondent of *The Chicago Daily News*.

Boston Bruins won world's ice hockey championship by defeating Toronto Maple Leafs, 4 games to 1.

17 Marketing Quotas in Agricultural Adjustment Act of 1938 held constitutional by U.S. Supreme Court in 6 to 2 decision.

Nomination of Thomas R. Amle to Interstate Commerce Commission withdrawn by Pres. Roosevelt after repeated attacks in Senate.

Italian and German newspapers, after day of silence, denounced Roosevelt's plea for peace as demagogic and insolent; Hitler summoned Reichstag to hear personal reply April 28.

Arrival of Hiroshi Saito's ashes aboard U.S. cruiser in Yokohama occasioned public demonstrations of friendship toward U.S.A.

18 Col. Charles A. Lindbergh summoned to active duty in U.S. Air Corps to make survey of military aviation.

Herbert Benjamin, secretary-treasurer of Workers' Alliance, admitted membership in Communist party.

Prime Minister Chamberlain implied in Commons debate that Great Britain would fight to preserve independence of the Netherlands, Switzerland, and Denmark.

German fleet sailed for manoeuvres in Spanish waters.

R. G. Menzies elected leader of United Australia party to succeed Joseph A. Lyons; he was commissioned to form cabinet two days later.

Gen. Franco began demobilization of Spanish army.

19 S.S. "Paris" of French Line destroyed by fire at Le Havre; police investigated possibility of sabotage.

Viscount Halifax denied British intention to encircle axis powers.

Pres. Roosevelt urged Democratic party to retain unified liberalism.

20 Adolf Hitler's 50th birthday celebrated by gigantic military parade in Berlin.

Mussolini called Roosevelt's plea for peace an absurd proposal based on "pyramidal errors of geography"; he cited preparations for Rome's fair of 1942 as evidence of Italy's peaceful intentions.

Leslie Burgin appointed British minister of supply to requisition military supplies in case of war.

News correspondents in Central Europe revealed that Germany had asked small nations mentioned in Roosevelt's message of April 15 if they feared aggression by Reich or if they had requested Roosevelt's mediation.

Franco's victory parade in Madrid again postponed; announcement was made in Rome and interpreted as strategy to delay withdrawal of Italian troops.

21 French Gov't adopted sales tax of one per cent to help pay cost of armaments.

House of Representatives voted to extend, until June 30, 1941, Roosevelt's power to re-value dollar.

APRIL—Continued

22 Polish foreign office announced it had received no questionnaire from German Gov't regarding Roosevelt's note of April 15; Switzerland publicized its answer that it had "confidence in the respect for Swiss neutrality."

23 British ambassador to Germany, Sir Nevile Henderson, returned to post in Berlin.

Conference between Galeazzo Ciano and Yugoslav foreign minister closed at Venice; communiqué stated that Yugoslavia had agreed to "faithful collaboration" with Rome-Berlin axis.

24 Pres. Germán Busch of Bolivia dissolved congress, suspended all laws, and assumed full dictatorial powers.

Marquess of Lothian appointed British ambassador to the United States to succeed Sir Ronald Lindsay.

Bishop Francis Joseph Spellman of Boston appointed archbishop of New York by Pope Pius XII.

Sec'y of State Hull announced U.S.A. had begun negotiations with Great Britain, Belgium, and the Netherlands to barter cotton and wheat for rubber and tin.

Leon Henderson appointed by Pres. Roosevelt to Securities and Exchange Commission.

25 First Gov't reorganization plan of Pres. Roosevelt requested consolidation of 21 independent bureaus and departments into three offices—Federal Security Agency, Federal Works Agency, and Federal Loan Agency.

Budget of £1,322,000,000, including estimated £630,000,000 for defence, introduced in House of Commons by Sir John Simon; schedule provided for increase in income surtaxes, death duties, automobile and miscellaneous taxes.

Fines and imprisonment for publication of racial propaganda decreed by French Gov't.

William M. Leiserson nominated to succeed Donald W. Smith on National Labor Relations Board.

26 Conscription of British youths between ages of 20 and 21 announced in House of Commons by Prime Minister Chamberlain; Parliament approved the measure next day.

U.S. War Department ordered 571 war planes after Pres. Roosevelt signed \$549,000,000 appropriation for department.

27 Pres. Roosevelt asked Congress to appropriate \$1,750,000,000 for relief in fiscal year 1940.

Brig. Gen. George C. Marshall appointed chief of staff of U.S. Army to succeed Gen. Malin Craig.

Premier Eamon de Valera of Eire cancelled his trip to U.S.A. apparently because of problems arising from British conscription.

Crown Prince Olav and Crown Princess Martha of Norway arrived in U.S.A.

Yugoslavian Gov't reached preliminary accord with Croatian minority for granting of autonomy to latter.

28 In lengthy speech before Reichstag, Herr Hitler rejected Pres. Roosevelt's plan for peace conference; revealed that he had asked Poland for return of Danzig and for strip of land across Polish corridor; denounced naval treaty with Britain and non-aggression pact with Poland; denied any plan to attack U.S.A.; agreed to sign reciprocal non-aggression pacts with European nations upon their specific request.

Two Soviet aviators crashed on Miscou island, New Brunswick, Canada, on flight to New York from Moscow across Arctic circle.

29 Subhas Chandra Bose, political opponent of Gandhi, resigned as president of All-India National Congress; he was succeeded next day by Rajendra Prasad.

30 New York World's Fair opened by Pres. Roosevelt.

Gen. Jose Felix Estigarribia, hero of war in Chaco, elected president of Paraguay.

First television receiving sets offered for sale in New York city.

MAY

1 Daniel C. Roper, former U.S. Sec'y of Commerce, nominated as Minister to Canada.

New United Methodist Church, with 8,000,000 members, voted to hold first general conference in April 1940.

"Cash and carry" section of U.S. Neutrality act of 1937 expired.

U.S.A. placed Caribbean islands under single military command with headquarters in Puer to Rico.

2 Premier de Valera of Eire warned Great Britain that any attempt to enforce conscription in Northern Ireland would be regarded as "an act of aggression."

3 Maxim Litvinov replaced as foreign commissar of U.S.S.R. by V. Molotov, president of the council of commissars.

4 Latvia agreed to sign non-aggression pact with Germany.

Northern Ireland exempted from military conscription by British Gov't.

Toll of deaths from two-day Japanese air-raids of Chungking estimated variously at 3,000 and 10,000.

5 Foreign Minister Josef Beck of Poland, in speech before Sejm, refused Hitler's demand for return of Danzig and for road across Polish corridor.

130,000 coal miners in Midwest and West joined strike of 320,000 Appalachian miners after negotiations between C.I.O. and operators broke down.

6 Johnstown won 65th Kentucky Derby by six lengths; Challedon was second, Heather Broom third.

Journalists in Rome reported that Pope Pius XII had instructed papal nuncios in Germany, Poland, Great Britain, Italy, and France to initiate conferences to prevent war.

7 Italy and Germany announced intention to conclude formal military alliance.

8 Duke of Windsor broadcast plea for international conciliation; broadcast was barred in Great Britain and Canada.

Pres. Anastasio Somoza of Nicaragua declared in address before U.S. Congress that an inter-ocean canal across his nation would strengthen defence of North America.

U.S. Senate added \$383,485,000 to \$835,119,000 appropriated by House for agricultural parity payments, conservation, and purchase of surplus commodities; bill was passed May 12.

9 Abolition of National Bituminous Coal Commission and National Emergency Council recommended by Pres.

Roosevelt in second plan of governmental reorganization.

Pres. Roosevelt ordered United Mine Workers and coal operators to submit new proposals for prompt settlement of national strike.

10 Constantine A. Ouman-sky appointed Soviet ambassador to U.S.A.

11 Seizure of Danzig by Germany would lead to war, asserted Prime Minister Chamberlain.

Rumania and Great Britain signed economic treaty providing for British credit extension of £5,000,000 and purchase of 200,000 tons of Rumanian wheat.

12 British-Turkish alliance announced by Chamberlain.

Japanese marines occupied Ku-lang Su island, international settlement in harbour of Amoy, China.

13 Fifteen associations of coal operators signed agreements to limit employment in Appalachian district to members of United Mine Workers' union.

14 "Recourse to the sword is not necessary" to solve territorial problems of Europe, declared Mussolini in conciliatory speech at Turin.

State troops of Kentucky moved into Harlan county as coal mines prepared to resume operation in defiance of United Mine Workers' union.

15 Racial propaganda in U.S.A. decried by Atty Gen. Frank Murphy in speech before conference of mayors.

16 Study of methods to employ idle capital in productive enterprise urged by Pres. Roosevelt.

17 King George VI and Queen Elizabeth arrived in Quebec to begin tour in Canada and United States.

British Gov't published White Paper for settlement of Palestine problem; it provided for limiting Jewish immigration to 75,000 until April 1944, thereby establishing permanent population ratio of approximately two Arabs to one Jew; state would become independent, if conditions warranted, in ten years.

U.S.A., Great Britain, and France landed naval forces at Ku-lang Su island; U.S. State Dept. rejected Japanese note of May 3 which sought revision of land regulations for international concession at Shanghai.

MAY—Continued

Carl Backman, Swedish aviator, lost in Atlantic after attempt to fly alone from Newfoundland to Sweden.

Admiral Sir Dudley Pound appointed First Sea Lord and chief of British naval staff to succeed Sir Roger Backhouse.

Sweden, Norway, and Finland declined simultaneously to sign mutual non-aggression pacts with Germany; Denmark accepted.

18 Jews staged huge riots in Jerusalem and Tel-Aviv in protest against British *White Paper* on Palestine.

Jerome N. Frank elected chairman of Securities and Exchange Commission.

19 Gen. Franco held his long-delayed victory parade in Madrid.

20 "Yankee Clipper" of Pan American Airways inaugurated regularly scheduled flights between U.S.A. and Europe.

21 German citizen shot to death by Pole in Danzig territory.

22 Germany and Italy signed ten-year treaty of military alliance at Berlin.

Italian communiqué said all Italian troops would leave Spain before end of May.

Automobile union of C.I.O. declared strike in Detroit affecting 24,000 workers; almost 50,000 others became idle the next day.

23 Establishment of Government-owned "capital credit banks" advocated by Asst. Sec'y of State A. A. Berle, Jr., in testimony before Temporary National Economic committee.

Queen Mother Mary injured in automobile accident.

24 Thirty-three men aboard sunken U.S. submarine "Squalus" were brought to surface in rescue bell; last group was rescued early May 25 after bell jammed.

Blue Peter won English Derby at Epsom Downs; Fox Cub was second.

25 Fritz Kuhn, leader of German-American Bund, arrested after indictment on charges of embezzling \$14,548 from bund.

Grover Bergdoll, U.S. draft evader in World War, arrested upon arrival in U.S.A. from Germany, where he had lived 20 years.

26 Republican officials and legislators of Michigan presented resolution to Sen. Arthur H. Vandenberg (Rep., Mich.) asking him to enter 1940 presidential campaign; Vandenberg accepted May 29 and recommended that Republican candidate run for one term only.

27 United Mine Workers and anthracite coal operators reached new two-year agreement providing for "union shop" in Pennsylvania fields; eight-week strike ended.

Removal of "irritants" in U.S. taxation, including capital stock and excess profit taxes, suggested by Sec'y of Treasury Morgenthau.

Fred B. Snite, Jr., young American living in "iron lung" after attack of infantile paralysis, bathed in grotto waters of shrine at Lourdes, France, after 5,000-mile pilgrimage.

28 Confessional Synod of Germany defied authority of Friedrich Werner, Nazi leader of German Evangelical Church.

Thomas H. Smith, Los Angeles aviator, disappeared in Atlantic after taking off from Maine in "baby" plane bound for Europe.

German diplomatic protest at seizure of Hamburg-Amerika liner "Sauerland" by Japanese, May 24, announced.

29 Franz Joseph II formally confirmed as ruling prince of Liechtenstein.

Hungarian Parliamentary elections gave Gov't substantial majority, but Nazis gained 47 seats.

Nazi Elite Guard seized palace of Archbishop Waitz of Salzburg, Catholic primate of Germany.

30 Wilbur Shaw won 500-mile automobile race at Indianapolis; Floyd Roberts, winner in 1938, was killed.

dianapolis; Floyd Roberts, winner in 1938, was killed.

German and Italian journals simultaneously revealed large extent of nations' participation in Spanish Civil War; intervention began less than two weeks after outbreak of revolt.

31 U.S.S.R. would refuse to sign any pact of collective security with Great Britain and France without guarantee of all European nations along its borders, declared Premier and Foreign Minister Molotov in address before Supreme Soviet.

Maj. Gen. George Moseley, in testimony before Dies committee, asserted a communist revolution was about to break out in U.S.A., and suggested that army should be mobilized to drive out all "reds"; the next day he suggested that all U.S. members of "world Jewry" should be deprived of civil rights.

Sir Edmund Ironside appointed British inspector general of overseas forces and Sir Walter Kirke named inspector of home forces; neither military position had been occupied since World War.

Germany and Denmark signed non-aggression pact.

JUNE

1 Townsend old-age pension bill defeated in House of Representatives, 302 to 97.

President Bru of Cuba ordered German ship with 907 Jews awaiting entry to leave Cuban waters; the order was later reconsidered but finally confirmed June 6.

Guarantee of Yugoslav borders pledged by Hitler during state dinner at Berlin for Regent Prince Paul.

2 Pope Pius XII declared he had received "assurances of determination to maintain peace" from five nations to whom he had addressed plea early in May.

3 Judge Martin T. Manton of U.S. Circuit Court of Appeals found guilty of charges of accepting "loans" from litigants; he was sentenced to two years in prison and fined \$10,000 on June 20.

4 Homer Martin announced that his branch of the United

Automobile Workers' Union had voted for reaffiliation with A.F. of L., 67,000 to 3,000.

5 U.S. Supreme Court sustained injunction against Mayor Frank Hague of Jersey City restraining him and other officials from interfering with meetings of C.I.O.

6 Admiral William D. Leahy nominated governor of Puerto Rico by Pres. Roosevelt; Archibald MacLeish named librarian of Congress.

Gen. Maurice Gustave Gamelin appointed commander of all French armed forces.

7 King George and Queen Elizabeth arrived in U.S.A. and were greeted at Niagara Falls by Sec'y of State Cordell Hull.

Estonia and Latvia signed non-aggression pacts with Germany.

German police officer slain in Kladno, near Prague; Nazis jailed more than 1,000 Czechs June 9 and levied fine of 500,000 crowns on district.

8 British monarchs welcomed in Washington by Pres. Roosevelt.

Chinese Defence council at Chungking ordered arrest of Wang Ching-wei for attempting peace negotiations with Japan.

9 Rumour circulated in Rome that Pope Pius XII had asked Chamberlain to call a four-power conference without Russia.

1944 Olympic games awarded to London.

Czech policeman slain by Germans at Nachod in Bohemian-Moravian protectorate.

10 Crowd of more than 3,000,000 greeted King George and Queen Elizabeth in New York upon their arrival to visit World's Fair.

The pictures on this page are, left to right:

PENDERGAST.....	Apr. 7
MARSHALL.....	Apr. 27
LITVINOV.....	May 3
FRANCO.....	May 19
MOSELEY.....	May 31



JUNE—Continued

11 U.S.A. defeated Great Britain in second match, 9 to 4, to retain International Polo Challenge cup.

12 William Strang of British Foreign Office flew to Moscow to revive negotiations for alliance with U.S.S.R.

Baseball museum and hall of fame opened at centennial celebration of first game at Coopers-town, N.Y.

The Netherlands decided to admit 194 of Jewish refugees aboard German liner "St. Louis"; Belgium, Great Britain, and France agreed next day to offer refuge to others.

Byron Nelson defeated Craig Wood, 70 to 73, in playoff for U.S. open golf championship.

13 Riot of C.I.O. strikers at Allis-Chalmers plant near Milwaukee injured 13.

House of Representatives voted 191 to 167 to limit TVA bond issue to \$61,500,000 and prohibit competition with private utilities outside specified area.

U.S.A. signed agreement to extend loans to Paraguay for two years.

14 Japanese blockaded British and French concessions in Tientsin after Britons had refused to give up four Chinese accused of killing puppet customs official.

John L. Lewis declared peace between C.I.O. and A.F. of L. impossible because latter was led by a "small group . . . reactionary in their attitude."

15 Umpire of German-American mixed claims commission found Germany guilty of sabotage in Black Tom and Kingsland munition explosions of 1916 and 1917.

Japan asserted blockade at Tientsin would not be lifted

The pictures on this page are, left to right:

TOWNSEND..... June 1
MAC LEISH..... June 6
CHAMBERLAIN..... June 24
HALIFAX..... June 29
GARNER..... July 27

until Britain modified its "pro-Chiang Kai-shek attitude."

16 Reichsbank placed under direct control of Hitler by official decree.

17 Propaganda Minister Goebbels called union of Danzig with Germany inevitable.

Rumanian police discovered alleged plot to assassinate King Carol and members of cabinet.

19 Tax revision bill passed by House of Representatives, 358 to 1; it repealed remainder of undistributed profits tax and substituted flat 18% tax on larger corporations, and removed other "irritants," but continued 3-cent first class postage; Senate passed bill unanimously June 22.

Explosion of bomb in market of Haifa killed 18 Arabs in renewed terrorism.

20 U.S. State Dep't announced additional protests to Japan over bombing of American property and occupation of Ku-lang Su island.

21 U.S. destroyer ordered by Japanese naval commander to leave port of Swatow with all other foreign vessels after occupation of city; the order was ignored next day by Admiral Harry E. Yarnell, commander of U.S. Asiatic fleet.

Transfer of property by Jewish firms in Bohemian-Moravian protectorate forbidden in law promulgated by Reich Protector Constantin von Neurath.

22 \$3,860,000,000 fund to spur business recovery through loans for self-liquidating projects proposed by Pres. Roosevelt in messages to House and Senate.

Japanese claimed 49 Mongolian war planes shot down in aerial battle on Manchoukuoan frontier.

London welcomed King George and Queen Elizabeth home after American tour.

23 U.S.A. signed agreement with Great Britain to barter 600,000 bales of surplus U.S. cotton for 85,000 tons of rubber to be used as war reserve.

Hatay republic ceded to Turkey by France; latter two also signed pact of mutual assistance.

Jesse H. Jones appointed administrator of new Federal Loan Agency; John M. Carmody named administrator of Federal Works Agency.

24 Chamberlain warned Germany that it could not expect peaceful settlement of European troubles unless it was "sincerely ready to talk reason with reasonable people."

25 U.S.S.R. confirmed reports of fighting between Soviet-Mongolian and Japanese forces since May 11.

26 U.S. Senate voted to discontinue Pres. Roosevelt's authority to devalue dollar, 47 to 31.

Annual naval manoeuvres of Great Britain in North Sea advanced from September to August.

Formal charges of embezzling \$100,000 of funds of Louisiana State university filed against its president, James M. Smith; Earl K. Long succeeded Richard W. Leche (Dem.), resigned, as governor of State.

27 Japan warned foreign shipping to leave Wenchow and Foochow before occupation of two ports.

28 Regular transatlantic passenger air service inaugurated by "Dixie Clipper" of Pan American airways.

Joe Louis knocked out Tony Galento in fourth round of championship fight.

29 Viscount Halifax declared Britain would go to war immediately "in the event of further aggression."

Senate-House conference restored Roosevelt's power to devalue dollar, but Senate refused to act on measure before President's authority expired next day.

30 U.S. Senate and House adopted conference report on \$1,756,000,000 relief bill for 1940 and sent it to Pres. Roosevelt.

Premier Hendrick Colijn of the Netherlands resigned; he formed another cabinet July 25 but resigned again July 27.

U.S. fiscal year ended with deficit of \$3,542,000,000 and public debt at new high of \$40,440,000,000.

JULY

1 British National Council of Labour broadcast appeal to German workers "to make it known to your Gov't that you want peace and not war."

2 Joseph Buerckel, Nazi commissioner of Ostmark, declared in Berlin address that Germany and France "want to be good neighbours."

Cardinal Innitzer of Vienna attacked by mob during riot at suburban church.

3 Expected Nazi putsch in Danzig failed to take place; Chamberlain charged that Germans were entering Free City disguised as tourists.

4 Germany and Italy revealed negotiations to repatriate former Austrians of Italian Tirol.

5 WPA workers began national strike in protest against Congressional order for 130-hour work month.

U.S. Senate voted 43 to 39 to restore Roosevelt's power to devalue dollar, continue exchange stabilization fund, and fix price of domestic silver at 71.11 cents per ounce.

C.I.O. called strike of tool and die workers in General Motors plant at Detroit.

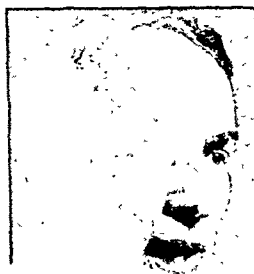
6 World's first autogiro mail route opened between Philadelphia and Camden, N. J.

7 Bobby Riggs of U.S.A. won all-England men's singles tennis championship at Wimbledon; Alice Marble won women's title next day.

Premier Kiosseivanoff of Bulgaria concluded visit of state to Berlin "in a feeling of most intimate friendship."

Chiang Kai-shek, in message on second anniversary of Chinese-Japanese war, predicted Chinese victory within year.

Japanese director of army information declared that "never in history have the Japanese people borne . . . such hatred for Britain."



JULY—Continued

8 Most of southern England "blackened out" in huge test of air-raid defences.

10 Chamberlain said in carefully-worded statement that British pledge of military assistance to Poland would become operative if Germany attempted to annex Danzig.

Policeman died in Minneapolis after riot of WPA workers on strike; a second fatal riot occurred July 14.

Military rebellion at Quito, Ecuador, suppressed by Gov't.

Italian Foreign Minister Ciano arrived in Spain on official visit.

11 Paul V. McNutt nominated as Federal Security administrator by Pres. Roosevelt; he was confirmed by Senate next day.

U.S. Senate Foreign Relations committee voted 12 to 11 to postpone all consideration of neutrality legislation until next session of Congress.

Italy extended order expelling all foreign residents from Tirol to include tourists.

American League all-star baseball team defeated National League, 3 to 1, at New York city.

12 Miner killed, another fatally wounded, in battle between pickets and National Guard in Harlan, Ky., coal field.

Britain announced supplementary expenditures of £79,100,000 for national defence and credits of £7,900,000 to Rumania and Greece.

WPA began dismissal of strikers for failure to report for work.

13 Roosevelt memorial at Hyde Park approved by Congress after 221 to 124 vote in House.

14 "You cannot strike against the Gov't" declared Pres. Roosevelt as negotiations proceeded for settlement of WPA's national walk-out.

France celebrated 150th anniversary of fall of Bastille with great military display in Paris.

Roosevelt sent special plea to Congress to revise U.S. neutrality law.

15 British-Japanese conference over Tientsin dispute opened at Tokyo.

Henry Picard defeated Byron Nelson for U.S. professional golfers' championship.

16 Soviet planes bombed Fularki in Manchoukuo; Japanese threat to retaliate in Siberia was followed later in day by another raid at Halunashan.

Extensive changes in anti-trust laws recommended in preliminary report of Temporary National Economic committee.

17 Seymour Weiss, one of Huey Long's three political heirs, indicted on charge of using U.S. mails to defraud; he was convicted September 14.

Bitter opposition in Italian Tirol to repatriation of former Austrians reported by journalists in Rome.

18 President Roosevelt abandoned attempt to secure revision of neutrality law after night conference with Democratic and Republican leaders of Congress.

19 Officials of Intergovernmental Committee on Refugees invited by Pres. Roosevelt to confer with him on methods of speeding up emigration from Germany.

20 Investigation of National Labor Relations Board ordered by House of Representatives, 254 to 134.

Mussolini announced that large feudal estates of Sicily would be broken up, irrigated, and divided among peasants.

21 U.S. Senate passed Hatch bill "without objection"; measure provided that no Federal employees should engage in national political campaigns except the President, members of his cabinet, and congressmen; Roosevelt signed bill August 2 after warning it might infringe civil liberties.

Refusal of Senate to adopt legislation on neutrality acted to deter business recovery and lessen hope for peace in Europe, asserted Pres. Roosevelt.

Gen. Queipo de Llano, commander of Spanish Andalusian forces, dismissed by Franco; Gen. Juan Yague, conqueror of Barcelona, was "transferred to new duties."

Jewish Agency for Palestine rejected Colonial Sec'y MacDonald's appeal for acceptance of British *White Paper* of May 17.

American Friends Service Committee agreed to resume assistance to child refugees in Spain after ceasing Franco's promise that seized food supplies would be restored.

Nazi officials announced that Italy had offered Germany free access to port of Trieste.

22 Export subsidy of 1.5 cents per lb. on U.S. cotton and from 1 to 2.1 cents per lb. on cotton goods, effective July 27, announced by Sec'y of Agriculture Wallace.

23 Robert S. Hudson, British sec'y of overseas trade, said he had discussed plan with German economic official whereby Great Britain would grant Reich large loan and access to raw materials in return for promise of peace; Chamberlain denied next day that these conversations had official sanction.

24 Anglo-Japanese formula for negotiation of Tientsin dispute announced by Chamberlain in House of Commons; it conceded right of Japanese to "remove such causes . . . as will obstruct them or benefit their enemy."

25 Japan announced it would close Canton river for two weeks, apparently to stop commerce between Canton and Hongkong.

Rev. Gerould Goldner, U.S. pastor, returned to Jerusalem after reported ransom of \$2,500 was paid to his Arab kidnappers.

U.S. Senate ratified treaty with Panama defining mutual relationships with respect to Panama canal.

26 U.S.A. denounced Japanese trade treaty of 1911, thus making possible application of arms embargo after expiration of six months' notice.

Francis B. Sayre, ass't-Sec'y of State, appointed U.S. high commissioner to the Philippines.

Renewed bombings in London, attributed to Irish Republican Army, killed one and injured 18 as House of Commons passed bill to deport suspected bombers.

Buenos Aires newspapers reported that Argentina intended to dispute U.S. claims of sovereignty over Antarctic regions.

Anti-trust proceedings against American Medical Association dismissed by Federal Court of District of Columbia.

27 John L. Lewis called John N. Garner a "labour-baiting, poker-playing, whisky-drinking, evil old man."

Mars made closest approach to earth—36,000,000 miles—since Aug. 1924.

28 Roosevelt's \$3,000,000,000 self-liquidating Works Fi-

nancing bill reduced to \$1,640,000,000 by U.S. Senate; the House, before killing it, approved reduction of \$850,000,000 July 29.

Germany and Japan initialled new commercial treaty.

29 France decreed postponement of legislative elections until 1942.

30 Conscription of all able-bodied Spanish labourers to serve state 15 days each year without pay ordered by Gen. Franco.

31 Military consultations between U.S.S.R. and Great Britain and France announced in House of Commons by Chamberlain.

Strikers of United Automobile Workers' union clashed with police in Cleveland; 46 injured.

AUGUST

1 House of Representatives killed Works Financing bill, 193 to 166; Senate had passed bill July 31 after reducing appropriation finally to \$1,615,000,000.

Vladimir Matchek, leader of Croatian minority, threatened to secede from Yugoslavia even though "it might mean a world war."

Enforcement of new prohibition law in Bombay led to riots in which more than 40 were injured.

2 Great Britain signed treaty granting Poland credit of £8,163,000 for military supplies.

U.S. Army Air Corps celebrated 30th anniversary of purchase of first plane.

3 \$800,000,000 Housing bill killed by House of Representatives, 191 to 170.

Sen. Robert A. Taft (Rep.) of Ohio, declared his candidacy for Presidential nomination in 1940.

National Guardsmen moved into Green Mountain dam district in Colorado after rioting by strikers, who returned to work next day.

Woman refugee from Czechoslovakia threw herself and two children from 13th floor of Chicago hotel.

4 Settlement of C.I.O. strike of automobile tool and die workers in Detroit announced by U.S. conciliator; strikers ratified pact next day.

AUGUST—Continued

House of Commons adjourned; Chamberlain said the situation in the Far East "makes my blood boil."

5 First session of 76th U.S. Congress adjourned *sine die*; total appropriations during session exceeded \$13,000,000,000.

Congress passed \$185,000,000 deficiency bill, including \$119,000,000 for Commodity Credit Corporation; it also amended Social Security Act to maintain payroll tax at 1% until 1942, begin payment of old-age annuities in 1940, include only first \$3,000 of incomes in unemployment tax, increase Federal contributions to States for old-age benefits, and extend provisions of act to seamen and agricultural labourers.

U.S. Army began two-week manoeuvres.

Princess of Orange-Nassau, second daughter of Crown Princess Juliana of the Netherlands, born at The Hague; she was named Irene Emma Elizabeth.

6 Marshal Smigly-Rydz, in speech at Cracow, said Poland would defend its integrity against any attack, direct or indirect.

Spanish Gov't announced execution of 53 persons accused of complicity in slaying of civil guardsman July 29.

Imperial Airways plane landed at Pt. Washington, L.I., to inaugurate British transatlantic mail service.

7 Danzig Senate agreed to negotiate dispute with Poland over administration of customs.

Saudi Arabia granted petroleum concessions for entire kingdom to Standard Oil Company of California.

Credit of about \$13,750,000 to Spain for purchase of U.S. cotton announced by Export-Import Bank.

Military manoeuvres in northern Italy ended before schedule.

Richard W. Leche, ex-governor of Louisiana, indicted on Federal charges of violating "hot-oil" act.

8 Nazi press unleashed violent attacks on Poland following address of Smigly-Rydz in Cracow August 6.

Self-sacrifice is a necessary pre-requisite to national and international peace, declared Pope Pius in a letter to French Canadian Catholics signed by

Cardinal Maglione, papal sec'y of state.

Henry F. Grady sworn in as assistant U.S. sec'y of state.

9 Yugoslavia refused Axis' demand for conscription of her economic and military facilities in event of war, according to American press dispatch from Belgrade.

Civilian advisory committee of six members for mobilization of U.S. economic resources in time of war announced by Departments of War and Navy.

Ramon Serrano Suñer appointed political chief of the Spanish Falange council.

Dirk Jan de Geer formed coalition cabinet in the Netherlands.

10 Albert Forster, Nazi leader of Danzig, declared in speech after visit with Hitler that Danzig's "liberation" might be near at hand.

Roosevelt threatened to bolt Democratic party in 1940 if it nominated "conservative candidates on a straddlebug platform."

11 Count Ciano and Joachim von Ribbentrop, Italian and German foreign ministers, began two-day conference in Berlin.

Secret meeting took place between Hitler and Dr. Karl J. Burckhardt, League of Nations high commissioner for Danzig, at Berchtesgaden.

Mendelssohn & Co., Amsterdam bank, suspended payments after death of director.

Moe L. Annenberg, publisher of The Philadelphia Inquirer and of "tip sheets" for horse racing, indicted for alleged evasion of \$3,258,810 in U.S. income taxes.

Britain announced it would surrender to Japan the four Chinese whose detention precipitated Tientsin incident.

12 Franco's new cabinet sworn in at Burgos.

British and French military missions began conversations with Russian staff in Moscow.

13 King Farouk of Egypt accepted resignation of Premier Mohamed Mahmud Pasha.

14 Pres. Roosevelt announced he would proclaim Thanksgiving Day for 1939 on November 23 instead of November 30.

Young Russian artist who stole Watteau's "L'Indifférent"

from the Louvre returned it after "correcting errors of earlier restorations"; experts praised his work in restoring painting.

15 José Estigarribia inaugurated as president of Paraguay.

16 Earl Baldwin of Bewdley declared in New York address that citizens of democracies should be ready to die for their ideals.

Nazi spokesman asserted Germany would demand whole of Polish Corridor but would offer Poland free access to sea.

Territory adjacent to Hongkong occupied by Japanese troops.

17 Proposed British settlement of Palestine question criticized by League of Nations' Permanent Mandates Commission as "not in accordance" with the terms of the mandate.

18 Germany assumed military control of Slovakia.

Great Britain refused Japanese demand that it surrender store of Chinese silver and prohibit circulation of Chinese currency in Tientsin before consulting other interested nations.

France granted Poland credit of 430,000,000 francs for purchase of war materials.

Aly Maher Pasha formed new cabinet in Egypt.

19 Germany and U.S.S.R. signed seven-year trade agreement.

British sergeant in Shanghai killed two and wounded six Japanese-controlled Chinese policemen who fired upon him.

Pope Pius XII appealed to European powers not to assume "the inexpressible responsibility of . . . force."

20 Poland shifted large numbers of troops to protect Slovakian and Moravian frontiers.

Japanese blockade of British concession in Tientsin broken by Hai river floods.

21 Announcement in Berlin of 10-year non-aggression pact between U.S.S.R. and Germany caused consternation in world's capitals.

22 British cabinet announced the German-Soviet treaty "would in no way affect their obligations to Poland"; Parliament summoned to meet August 24.

23 Great Britain warned Germany, in message dated August 22 and delivered by Sir Neville Henderson, that it was determined to fulfil pledges to Poland; Hitler's reply insisted upon free hand in eastern Europe.

Seven-power conference of "Oslo group" met at Brussels; King Leopold of Belgium broadcast appeal for peace.

Gen. Carlos Quintanilla assumed presidency of Bolivia after suicide of Pres. Germán Busch.

Nine-day milk strike in New York city ended by vote of dairy farmers' union.

New world's automobile speed record of 368.85 m.p.h. established by John Cobb at Bonneville Salt Flats, Utah.

24 Nazi-Soviet non-aggression pact signed in Moscow; it provided that each should refrain without reservation from attacking the other, that neither should join powers aimed at the other, and that both should remain in constant consultation on questions of common interest.

British parliament met and passed emergency powers bill for Government to rule by decree; Chamberlain declared war imminent but still hoped for "a way out"; he called Russia's action a "very unpleasant" surprise.

Adolf Hitler returned to Berlin from Berchtesgaden and held lengthy conference with Goering, Goebbels, and military chiefs.

Roosevelt appealed to Hitler and President Moscicki of Poland to settle their controversies by direct negotiation, arbitration, or conciliation; in another message, he urged King Victor Emmanuel of Italy to intervene on behalf of peace.

France urged all Parisians to leave city immediately unless their presence was indispensable.

Albert Forster elected head of Gov't of Danzig to replace Arthur Greiser.

Japanese Foreign Minister Hachiro Arita said Japan's revised foreign policy was one of "independence without relying upon any other power."

Second peace message within five days broadcast by Pope Pius XII.

Louis Lepke, object of nationwide manhunt, surrendered to Federal agents in New York city.

AUGUST—Continued

British railway workers called off strike scheduled for midnight August 26.

George L. Carpenter elected general of Salvation Army to succeed Evangeline Booth.

25 Hitler requested conference with Sir Neville Henderson and, according to British *White Paper* of September 1, told British ambassador he was "determined to abolish Macedonian conditions in Poland"; but was willing "to approach England with a large and comprehensive offer" which would "guarantee the existence of the British Empire," provided Britain would agree to negotiate his "limited" colonial demands and not ask revision of his obligations toward Italy and Russia.

Poland and Great Britain signed five-year military alliance in London.

German Gov't severed communications between Berlin and European capitals and cancelled celebration at Tannenberg scheduled for August 27.

Pres. Moscicki of Poland replied to Pres. Roosevelt that his nation stood ready to negotiate directly with Germany; Roosevelt then addressed second message to Hitler asking him to adopt pacific settlement also.

Japanese ambassador to Berlin ordered to file protest with German Gov't against signing of Nazi-Soviet pact.

French army engineers removed pontoon bridges across Rhine.

Premier Daladier declared that a betrayal of Poland by France would leave France without friends or support.

Martial law proclaimed in Chile after abortive military revolt.

26 Sir Neville Henderson flew to London to present Hitler's verbal message of August 25 at cabinet meeting.

Serbo-Croat accord granted Croatia separate parliament and established freedom of press and assembly in Yugoslavia; new cabinet of Dragisha Cvetković included Dr. Vladimir Matchek as vice-premier, and five other Croats.

British and French military missions left Moscow.

Rationing of food and clothing decreed throughout Germany; Nazis cancelled Nuremberg party congress.

Germany's ministers to Switzerland and the Netherlands and its ambassador to Belgium assured these countries that the Reich would respect their neutrality in general war.

Hungary rejected Rumania's proposal for non-aggression pact but offered to negotiate treaty guaranteeing rights of minorities in both countries; this counter-proposal was rejected by Rumania next day.

Betty Jameson won U.S. women's national golf championship.

27 Hitler, in reply to letter of August 26 from Daladier which suggested direct negotiations between Berlin and Warsaw, demanded return of both Danzig and the Polish Corridor; German propaganda ministry accused Daladier of misinterpreting Fuehrer's letter.

Reichstag convened in secret session to be addressed by Hitler.

Mussolini responded to Canadian Prime Minister King's plea for peace that he would bend every effort to forestall war.

28 British cabinet completed reply to Hitler's communications of August 23 and 25; as published in British *White Paper* of September 1, this note requested direct negotiations between Germany and Poland and offered to discuss Hitler's proposal for a "general understanding" regarding the differences between Germany and Poland had been peacefully composed.

French-German frontier closed; the Netherlands mobilized; Switzerland and Belgium called up more troops.

Polish official statement condemned German press stories of mistreatment of German minority as "untrue and entirely imaginary."

Bratislava occupied by German troops.

German liner "Bremen" detained and searched for offen-

sive weapons in New York harbour; it did not sail until August 30.

Gen. Nobuyuki Abe appointed Japanese premier after resignation of Kiichiro Hiranuma's cabinet; Tokyo press pointed out possibility of more amicable relations with Great Britain and the United States.

British merchant ships ordered by Admiralty to leave Mediterranean and Baltic; Canada established national control of shipping.

Seven Japanese aviators landed in Nome, Alaska, on first lap of flight around the world.

29 Hitler's reply to British message of August 28 telephoned to London; as reported in the British *White Paper* of September 1, it accepted British proposal for direct discussions providing a Polish emissary "with full powers" should arrive at Berlin August 30; Hitler denied this was an ultimatum.

Chamberlain, in speech before Commons, criticized press for placing its own interpretations on German-British exchange of communications.

Poland protested German military occupation of Slovakia.

Belgium and the Netherlands offered to mediate for France, Great Britain, Germany, Poland, and Italy; Germany expressed its "deep gratitude for this generous gesture" next day.

Supreme Soviet deferred ratification of non-aggression pact with Germany; reinforcements ordered for garrisons on western border.

Rationing of food and partial evacuation of larger cities ordered by Mussolini; Rome blacked out for first time in crisis.

Ivan Subovitch took office as first governor of autonomous Croatia.

Pres. Roosevelt repeated his belief that failure of Congress to modify U.S. Neutrality act encouraged Hitler to provoke war crisis.

Gen. Shunroko Hata named minister of war in new Japanese cabinet; Premier Abe took over portfolio of foreign affairs.

30 Another message to Hitler drafted by British cabinet and delivered shortly before midnight; British *White Paper* of September 1 revealed that note expressed willingness to initiate Polish-German discussions at earliest practicable date; in reply, German Foreign Minister von Ribbentrop read to Sir Neville Henderson the text of 16-point proposal published in Berlin the next day; Chamberlain earlier had declared in telegram "it is . . . unreasonable to expect that we can produce a Polish representative in Berlin today."

Hitler established defence council of six headed by Goering.

Poland speeded up mobilization to include all qualified men between 21 and 40.

German military rule proclaimed in Slovakia by Premier Josef Tiso.

31 Sixteen-point "peace plan" published by Hitler suggested return of Danzig to Germany, retention of Gdynia by Poland, plebiscite in Polish Corridor to be held after a year, and extraterritorial communications zone through Corridor for whichever nation lost plebiscite; Polish Gov't, though it did not receive formal text, pronounced the terms of the proposal unacceptable.

British fleet, army, and air force placed on war footing; immediate evacuation of 3,000,000 persons from London announced; censorship of all messages ordered.

Soviet-German pact ratified by Supreme Soviet; Premier Molotov declared that proposed mutual assistance pact with Great Britain and France had been dropped because Britain had supported Poland's objections to Soviet troops on Polish soil, and had insisted on a clause covering indirect aggression.

Slovakia demanded that Poland return Teschen area occupied after Pact of Munich.

U.S. liner "America" launched at Newport News.

The pictures on this page are, left to right:

FORSTER Aug. 24
HENDERSON Aug. 25
MUSSOLINI Aug. 27
RIBBENTROP Aug. 30
MOLOTOV Aug. 31



EUROPEAN WAR

SEPTEMBER

Germany began invasion of Poland at 5:45 A.M. on four fronts after proclamation to army by Hitler; German planes raided Warsaw and other Polish cities.

British-French ultimatums to Germany demanded suspension of aggressive action in Poland and withdrawal of all forces; France decreed general mobilization and martial law.

Hitler, in address to Reichstag, said Germany had "returned fire" because Poland had mobilized instead of sending emissary to discuss his proposals; declared he would wage humane war and not seek foreign help; named Goering as his successor and Rudolf Hess as next in line in case "something happens to me"; said the "Westwall is . . . for all times the Reich frontier in the west."

Danzig accepted as part of Reich after Albert Forster proclaimed its reunion with Germany.

Italian official communiqué stated "Italy will take no initiative whatever toward the military operations."

Chamberlain declared that "the responsibility for this terrible catastrophe lies on the shoulders of one man" and thanked Mussolini for his efforts to maintain peace.

Britain and France conferred upon expiration date for joint ultimatums to Germany; Chamberlain announced that Italy was striving to call a five-power conference.

Germany reported important advances in Polish Corridor and Upper Silesia; air raids on Warsaw and other cities continued.

French Chamber of Deputies voted Daladier authority to declare war and adopted war

budget of 69,000,000,000 francs; final mobilization began.

Germany, France, and Great Britain issued declarations of intent to refrain from inhumane warfare and attacks upon civilian populations.

Russian military mission arrived in Berlin.

Eire approved declaration of neutrality.

Ernest H. Gruening appointed governor of Alaska to succeed John W. Troy, resigned.

New perfusion pump to keep different types of animal tissue alive at same time announced by Col. Charles A. Lindbergh.

Great Britain declared war on Germany at 11 A.M. after setting time limit to ultimatum of September 1; France entered conflict officially six hours later.

British liner "Athenia," bound for Montreal with 1,418 aboard, "torpedoed" 200 miles west of the Hebrides; it sank next day; total loss of life was announced later, October 9, as 112, including 30 Americans.

Hitler left Berlin to join army on eastern front after issuing reply to British ultimatum in which he blamed British cabinet for outbreak of hostilities.

Winston Churchill entered British war cabinet as First Lord of the Admiralty; Anthony Eden was named secretary for the Dominions, without seat in cabinet, and Lord Hankey minister without portfolio; Viscount Gort appointed commander in chief of British field forces.

President Roosevelt declared in special broadcast that every effort of his administration would be directed toward maintaining true neutrality; he warned Americans against profiteering, urged them to discriminate between fact and rumour concerning the war, and pleaded for national unity.

British naval blockade of Germany in Baltic and North seas reported in Washington.

King George VI, in message broadcast throughout world, asked British subjects every-

where to "make our cause their own."

Australia and New Zealand announced state of war with Germany.

First French war communiqué announced that operations by land, sea, and air had begun against Germany.

British air force bombed German fleet at Wilhelmshaven and at western entrance to Kiel canal.

Loss of Bydgoszcz (Bromberg) and Grudziadz, strategic cities of Corridor, admitted by Polish general staff; Germany announced that northern Corridor was completely cut off.

Ronald Hibbert Cross appointed minister of economic warfare in Chamberlain's war ministry; Lord MacMillan became minister of information and William S. Morrison minister of food.

Gen. Franco decreed "the strictest neutrality on the part of Spanish subjects"; Yugoslavia, Bulgaria, and Rumania officially proclaimed their neutrality; statement of Japanese cabinet said nation "does not intend to be involved in it."

Popolo d'Italia reaffirmed Italy's intention to remain neutral unless attacked; resumption of semi-normal shipping schedules announced.

British ministry of information announced that Royal Air Force planes had scattered 6,000,000 leaflets over North-western Germany, protesting friendship for German people and urging them to place no confidence in Hitler; similar "raids" were repeated in following weeks.

U.S. State Dep't announced it would issue American passports for travel abroad only in cases of "imperative necessity."

Australian tennis team won Davis cup from U.S.A., 3 to 2, at Haverford, Pa.

Neutrality of U.S.A. proclaimed in two declarations: First was issued in accordance with international law; second was issued under terms of Neutrality act of 1937 and prohibited

export or transshipment to belligerents of arms, munitions, vessels, aircraft and aircraft parts, explosives, and chemicals for chemical warfare; other proclamations regulated use of Panama Canal by belligerents and travel abroad by Americans.

Removal of Polish capital from Warsaw to Lublin reported as German troops intensified drive on four fronts and announced virtual control of Upper Silesia.

French army came "in contact" with Germans along western front, according to communiqué of general staff.

Prime Minister Hertzog of South Africa resigned after parliament voted to sever diplomatic relations with Germany, 80 to 66.

Stocks rose 1 to 27 points in heavy trade on New York Stock exchange.

Earl Browder was said to have admitted before Dies Committee using false American passport; he declared a group of "wealthy Republicans" had offered U.S. Communist party \$250,000 in 1936 to nominate Roosevelt on its ticket.

Berlin's war ministry denied that German submarine had torpedoed "Athenia."

France and Poland signed protocol to treaty of alliance which prohibited either from signing separate armistice or treaty of peace.

Col. Roscoe Turner won Thompson Trophy air race at Cleveland for third time; his average speed was 282.53 m.p.h.

Cracow occupied by Germans, who also announced capture of Kielce; Poland admitted German advance from north as far as Plonsk.

French troops advanced into western Germany at several points, according to army communiqué which also announced debarkation of British troops in France.

Union of South Africa declared war against Germany; Gen. Jan Christiaan Smuts formed war cabinet.

The pictures on this page are, left to right:

CHURCHILL.....Sept. 3
THE WINDSORS.....Sept. 12
LINDBERGH.....Sept. 15
BECK.....Sept. 18
CALINESCU.....Sept. 21



SEPTEMBER—Continued

Eduard Benes and other former Czech leaders offered to form Czech legion to fight for Allies.

Great Britain suspended London naval treaty of 1936 and separate naval treaties with Poland and U.S.S.R.

American naval patrols established in Atlantic and Caribbean, to survey movements of belligerent fleets.

Liner "Bremen" reported by Berlin safe in unidentified neutral port, later revealed as Murmansk, U.S.S.R.

Iraq requested German minister to leave Baghdad.

7 Polish garrison of 77 men at Westerplatte fortress in Danzig harbour surrendered after six-day siege; German army continued "pincer" drives toward Lodz, Poznan, and suburbs of Warsaw.

German reinforcements for Westwall announced in Paris.

Egypt officially notified Great Britain it had severed diplomatic relations with Germany.

8 German army advanced to outskirts of Warsaw; high command falsely reported partial occupation of city; Poles claimed Germans had stolen wave-length of Warsaw radio station to announce capture.

Limited national emergency declared by Pres. Roosevelt, who ordered increases in enlisted strength of all U.S. armed forces.

Contraband bases for search of vessels established by Great Britain at Gibraltar, Kirkwall in the Orkneys, Weymouth, North Foreland, and Haifa.

Report of U.S. naval attachés said "Athenia" was torpedoed.

9 Field Marshal Goering declared in Berlin speech that Germany wanted nothing from France and accused England of scheming to "fight till the last Frenchman"; he implied Germany would like peace, but "not another Versailles."

Fall of Lodz announced by Germans, who began encirclement of Warsaw.

British war cabinet decided to make military and economic preparations for war of at least three years.

French occupation of most of Warndt forest, near Forbach, announced in Paris.

Reinstatement of independent Czech republic identified by Chamberlain with aims of war against Germany.

Immediate reorganization of executive offices ordered by Pres. Roosevelt "in order that the nation may not again be caught unaware."

10 Repulse of attack on Warsaw attributed by Germans to civilian sniping; German high command announced that two Polish armies had been trapped in pocket west of Warsaw, and near Radom; removal of Polish capital from Lublin to Lwow reported.

Germans launched counter-attack at extreme northern end of western front, where Berlin admitted for first time that French had crossed border.

Canada formally declared war against Germany.

Russia disclosed officially that it had called up reservists.

11 Poles and Germans met in fierce battles in Poznan and Lodz regions, at Warsaw, and along 250-mi. front from East Prussia to Slovakian border; Germans extended southern salient toward Lwow (Lemberg).

German counterattack checked at northern sector of western front; French reported advances north-east of Bitche.

Quotas on sugar suspended by Roosevelt to curb sharp rises in price.

Canadian parliament voted to appropriate initial war fund of \$100,000,000 and defeated motion to prohibit expeditionary force to Europe.

"There can be no lasting peace until Nazism . . . is banished from the earth," said Anthony Eden in international broadcast.

Counter-blockade against Great Britain announced in Berlin.

12 Chamberlain flew to undisclosed town in northern France to attend first meeting of Allies' Supreme War Council, which agreed "to give all possible assistance to their Polish ally."

Virtual encirclement of Warsaw reported by Germans after they had severed Warsaw-Bialystok railroad; fall of Poznan announced; drive toward Lwow continued.

Duke and Duchess of Windsor's return to England, after

three-year exile, announced in London.

Gen. Umezu, new commander-in-chief of Japanese forces in Manchoukuo, said Japan desired "regulation of relations with the Soviets"; Gen. Juzo Nishio appointed commander of all Japanese armies in China.

Canadian declaration of war did not affect U.S. pledge to help Dominion if it was invaded, said Pres. Roosevelt.

13 Daladier took over foreign ministry in modification of French cabinet, transferred Georges Bonnet to ministry of justice, and created new ministry of armaments headed by Raoul Dautry.

Bombing of open cities threatened by German supreme command unless Poles ceased civilian warfare; U.S. Ambassador Anthony Biddle, Jr., declared in report to State Dept that Germans had already conducted such raids.

U.S. Congress summoned by Pres. Roosevelt to meet in special session September 21 to consider revision of Neutrality act.

Chamberlain declared in House of Commons that France was "no less convinced than are we that there can be no peace unless the menace of Hitlerism has been finally removed."

German troops pushed toward outskirts of Lwow and extended drive from East Prussia toward Brest-Litovsk.

U.S. submarine "Squalus," sunk off Atlantic coast since May 23, towed to navy yard at Portsmouth, New Hampshire; 25 of its 26 dead were removed in next two days.

14 Gdynia surrendered after two-week siege; encirclement of Warsaw reported complete; removal of Polish capital to Zaleszczyki, on Rumanian frontier, announced in Berlin.

Repeal of arms embargo in U.S. Neutrality act would constitute intervention in European war, said Sen. William E. Borah (Idaho, R.) in radio broadcast.

U.S.A. warned all belligerents not to violate its rights as a neutral.

Pope Pius XII urged all belligerents to spare non-combatant citizens.

Hungarian Foreign Minister Csaky affirmed nation's intent to remain neutral.

15 U.S.S.R. and Japan agreed upon truce, effective September 16, to end hostilities on Manchoukuoan and Mongolian frontiers.

Germans advanced to outer fortifications of Brest-Litovsk and continued drives east of San river; Poles claimed large numbers of troops had escaped from pocket around Kutno and rushed to defence of Warsaw; party of 60 diplomats and members of their staffs fled from Poland to Cernauti, Rumania.

Australian Prime Minister R. G. Menzies formed war cabinet of six members and announced new taxes to meet costs of war.

Col. Charles A. Lindbergh, in first formal speech since 1931, broadcast appeal to Americans not to become involved in war.

Loring Christie appointed Canadian ambassador to U.S.A.

Strike of seamen in New York city prevented sailings of American liners bound for Europe.

16 German high command issued ultimatums that Warsaw either surrender or evacuate its civilians; or otherwise suffer unrestricted bombardment; the command was unanswered; fall of Bialystok and Kutno announced in Berlin.

Convoy system for merchant shipping announced by British Admiralty; unofficial statistics for first two weeks of war placed British losses at 21 ships of 123,000 tons.

"Great activity" in Saar region and strong German reinforcements announced by French army headquarters.

German official statement accused Great Britain and Poland of violating principles of humane warfare and threatened to retaliate against British blockade.

Resumption of general Japanese offensive in central China reported by Domei, Japanese news agency.

17 Soviet troops invaded eastern Poland along length of frontier after notifying Poland and assuring all powers with whom it maintained diplomatic relations that it nevertheless intended to pursue a policy of neutrality; Premier and Foreign Minister Molotov explained invasion was necessary because Poland had "suffered bankruptcy" and Russia was obliged to protect its "brother Ukrainians and brother Byelo-Russians."

SEPTEMBER—Continued

British aircraft carrier "Courageous" sunk by German submarine; announcement was delayed until next day; official list of casualties on September 20 placed dead and missing at 515.

Capture of Brest-Litovsk announced after severe battle; thousands of Polish troops and refugees fled across Rumanian border.

Bobby Riggs and Alice Marble won U.S. singles tennis championships.

Pres. Moscicki signed proclamation that Polish Gov't would function "with full authority" in foreign country.

18 Russian and German forces met at Brest-Litovsk, according to Berlin report; joint commission met to set up limits of occupation for each army; attack on Warsaw resumed; Germans announced capture of rich oil regions of Ukraine, where Russia also advanced westward to Stanislawow.

Polish Gov't fled country; Pres. Moscicki, Foreign Minister Beck, and Marshal Smigly-Rydz arrived at Cernauti, Rumania.

Alfred M. Landon and Frank Knox, titular leaders of Republican party, invited by Pres. Roosevelt to confer with him September 20 before special session of Congress.

British ministry of information declared Russian invasion of Poland was "not justified by the arguments put forward by the Soviet Gov't"; the Vatican's *Osservatore Romano* denounced Russian action as based on a "pretext . . . that was not courageous."

Premiers and foreign ministers of Denmark, Finland, Norway, and Sweden met at Copenhagen to outline program of neutrality; these nations and Iceland issued a joint declaration next day that they would cooperate intimately to preserve their peace and protect their own economic interests.

19 Hitler at Danzig repeated he had no claims against France and Great Britain, but declared Germany and Russia had agreed that "Poland will never rise again in the form of the Versailles treaty"; he said Germany would fight for seven years if necessary, and threatened to retaliate against British blockade by using "a weapon with which we cannot be attacked."

Official French reply to Hitler's Danzig speech called address a "sad plea . . . blustering . . . and lying"; official British reply called it "full of crass misstatements."

Russian troops occupied Vilna and continued advances in White Russia and Ukraine; blockade of Estonian coast by Soviet navy reported after Polish submarine had escaped from internment at Tallinn harbour; Germans issued ultimatum for surrender of Lwow.

Massing of German troops at Aachen on Belgian border reported in Paris.

20 Complete elimination of Poznan-Kutno pocket after furious nine-day battle announced by German high command; Berlin also announced arrival of Gen. von Brauchitsch, commander-in-chief of army, at western front and transfer of many divisions from Poland to Westwall.

Widespread revolt of Czechs in Bohemia and Moravia, beginning September 17, reported by British ministry of information; Berlin denied it, as did Pres. Emil Hacha September 23.

Rumanian Gov't announced Marshal Smigly-Rydz would be interned for duration of European war.

Chamberlain, in weekly report before House of Commons, asserted Hitler's Danzig speech "did not change the situation"; he said Soviet invasion of Poland was not unexpected.

German military officers arrived in Moscow to decide upon method of partitioning Poland.

Joe Louis knocked out Bob Pastor in 11th round of heavy-weight championship bout at Detroit.

21 Repeal of U.S. arms embargo asked by Pres. Roosevelt in message to special session of Congress; he said he regretted having signed Neutrality act of 1937 and declared if the embargo were annulled "the United States will more probably remain at peace than if the law remains as it stands."

Premier Armand Calinescu of Rumania assassinated by members of pro-Nazi Iron Guard in Bucharest; assassins were executed on the spot, and new temporary cabinet of Gen. George Argesanu ordered execution or imprisonment of hundreds of other Iron Guardists during next two days.

Blue Book of secret diplomatic messages between British diplomats and Foreign Office from March to Sept. 1939 published in London.

Dr. Joseph Goebbels denied that Germany had any intention of violating neutrality of Belgium, the Netherlands, or Luxembourg.

Premier Daladier charged Germany and Russia had signed secret pact Aug. 23, 1939 to partition Poland.

Russian troops announced occupation of Lwow after withdrawal of German besiegers, but Germany claimed capture of city September 22.

22 Nazi-Soviet agreement on military demarcation of Poland announced in Berlin; line ran from East Prussian border south along Pissa, Narew, Bug, Vistula, and San rivers.

Frontier areas reported partially flooded by Belgium and the Netherlands as experimental precaution against German invasion.

All elections in Great Britain suspended for duration of war.

Two submarines of undisclosed nationality had been sighted off North American coasts, said Pres. Roosevelt.

Allies' Supreme War Council held second meeting in England.

Wholesale arrests of Ukrainian landlords announced in Moscow.

23 Conquest of Poland completed, declared German high command; Poles continued organized resistance at Warsaw and Modlin, and on Hela peninsula; German troops began withdrawal behind military line of demarcation.

Mussolini reaffirmed Italy's neutrality, in his first speech since May 20; he said that since the Allies had not declared war on Russia they should also face "the German *fait accompli*" in Poland.

Pan-American conference on neutrality convened at Panama city; Pres. Arosemena of Panama urged solidarity of American democracies in safeguarding peace.

Recapture of Kaoan claimed by Chinese.

Alfred M. Landon urged Pres. Roosevelt to disclaim intention of running for third term.

War appropriations up to 15,-000,000,000 marks decreed by German defence council.

Hungary resumed diplomatic relations with U.S.S.R., ruptured since February 2.

Adm. Kichisaburo Nomura appointed Japanese foreign minister.

24 Heavy artillery of French and Germans opened fire for first time along 80-mi. Rhine front from Lauterbourg to Swiss border.

Neva river reported closed to foreign shipping by U.S.S.R.

Half of Warsaw in flames and 1,000 civilians killed after intense 24-hour bombardment, according to Polish dispatches.

Major Japanese offensive in Kiang-si and Hunan provinces along 70-mi. front announced in Tokyo.

25 French planes raided Zeppelin factory at Friedrichshafen; heavy bombardment of German fortifications along Rhine and in Saar sector continued.

Soviet troops concentrated on Estonian border as Foreign Minister Karl Selter returned to Tallinn after hurried conference in Moscow.

21st American Legion convention opened in Chicago.

26 British fleet attacked by Nazi planes in North sea; Berlin claimed that "Ark Royal," aircraft carrier, had been "destroyed," but London denied that any ship had been hit.

French communist party dissolved by decree of cabinet.

Removal of all known communists from U.S. governmental positions had been ordered by administration, according to Rep. Martin Dies (Dem., Tex.).

Destruction of "perhaps a third" of Germany's active submarines announced by Winston Churchill; he said more than 2,000,000 tons of German shipping were sheltered in Reich or interned in neutral harbours.

Hitler returned to Berlin after 23-day absence on Eastern front.

Disbandment of War Resources Board announced by Pres. Roosevelt.

27 Warsaw surrendered unconditionally after 20 days of siege; German troops began occupation of city October 1.

Basic rate of British income tax raised to 37.5%—highest in history—for 1940-41 fiscal year, to meet £2,000,000,000 war budget.

SEPTEMBER—Continued

German Foreign Minister von Ribbentrop and Estonian Foreign Minister Selter arrived in Moscow for conferences with Soviet Gov't; Turkish Foreign Minister Shukru Saracoglu continued talks with V. Molotov.

Col. Gen. Gerd von Rundstedt named military administrator of German occupation in Poland; Hans Frank appointed civil administrator.

28 Constantine Argetoianu appointed Rumanian premier to succeed Gen. Argessanu, temporary head of Gov't since assassination of Premier Calinescu September 21.

Polish fortress at Modlin, near Warsaw, surrendered unconditionally.

Foreign relations committee of U.S. Senate voted approval of Pittman resolution to repeal arms embargo, 16 to 7.

Independence of India at end of European war demanded by Gandhi.

Raymond J. Kelly of Detroit elected national commander of American Legion.

Acceptance of Lhamo Dhondup, five-year-old Chinese boy, as 14th Dalai Lama of Tibet after meeting of secret council in Lhasa. Boy later named Linergh Tanchu.

29 Russo-German frontier agreement signed in Moscow; protocol statement declared both nations would try to persuade England and France to make peace with Germany, but would consult on "necessary measures" if Allies refused; agreement established new border as beginning at southern tip of Lithuania, running westward north of Augustow to East Prussian frontier, along Pissa river to Ostroleka, south-east to Bug river, along Bug to Krystynopol, then westward to San river and along San to its head.

Estonia concluded treaty of "mutual assistance" with U.S. S.R. which permitted Soviets to establish naval and air bases on Dagoe (Hiuu Maa) and Oesel (Saare Maa) islands and at port of Paldiski, also to maintain troops on Estonian soil; pact was ratified at Tallinn October 4.

William Z. Foster, chairman of U.S. communist party, declared party would not support U.S.A. if it entered war on side of Allies.

Dissolved communist party of France reorganized and adopted new name—French Workers and Peasants group.

Philippine National Assembly declined to modify stand for independence from U.S.A. in 1945.

30 Ignace Moscicki resigned as president of Poland in favour of Wladislaw Raczkiwicz; Gen. Wladislaw Sikorski named premier of Gov't, resident in France.

Armed British merchantmen would be treated as warships and torpedoed without warning, declared Berlin.

Permanent Pan-American advisory committee of 21 established at Panama city, to sit in Washington for duration of war.

OCTOBER

Winston Churchill condemned Russia's actions in Poland and Baltic states as necessary to its "national interest"; he praised the "great and friendly nation of Italy," declared menace of German U-boats was throttled, and said it would not be for Hitler to determine when war should end.

Conscription of 250,000 new troops between 21 and 22 ordered by British royal proclamation.

Italian Foreign Minister Ciano arrived in Berlin for conference with Hitler and von Ribbentrop; he returned to Rome next day.

Last regular centre of Polish military resistance disappeared with surrender of troops on Hela peninsula.

Chinese troops captured Japanese positions along Hongkong border in surprise attack.

2 Debate on U.S. Neutrality act began in Senate; Sen. Key Pittman (Nev., D.) presented administration's arguments for revision and Sen. William E. Borah (Idaho, R.) summarized views of opponents to repeal of arms embargo.

U.S.A. would withhold recognition of Polish conquest and continue relations with new Polish Gov't in France, declared Sec'y of State Hull.

Safety zone with average width of 300 mi. around all coasts of Western hemisphere except those of Canada and European possessions proclaimed by 21 republics in Declaration of Panama.

Vilhelms Munters, foreign minister of Latvia, arrived in Moscow for conference with Molotov.

U.S. merchant vessels must submit to halt and search, Berlin notified Washington.

3 David Lloyd George counselled the House of Commons "not to be in a hurry" to reject German peace proposals; Chamberlain declared that Soviet-German threats left England unmoved.

Lithuanian Foreign Minister Juozas Urbysys joined diplomatic trek to Moscow.

Conference of 21 American republics closed at Panama city.

Japanese War office admitted casualties of 18,000 killed, wounded and sick during border conflicts with Russia between May 11 and September 16.

4 Premier Daladier indicated in advance that France would reject Nazis' peace offer; "France does not want a truce between two aggressions," he said.

Turkey's refusal to recognize Polish partition reported.

American merchantmen warned by Sec'y of State Hull to avoid sea routes near belligerent nations.

French infantrymen occupied Borg forest east of Moselle river after tank battle.

Committee of British Dominion cabinet ministers to sit in London and co-ordinate war plans announced by Anthony Eden.

5 Latvia granted U.S.S.R. right to establish naval and air bases at Liepaja (Libau) and Ventpils (Windau) and to fortify Latvian coast; treaty of mutual assistance signed at Moscow.

Pres. Roosevelt made public a warning from German Grand Admiral Raeder that U.S. passenger ship "Iroquois" would be sunk near American coast, presumably by Allies; the "Iroquois" docked safely at New York city October 11.

Hitler reviewed his troops at Warsaw.

Grover C. Bergdoll, U.S. draft evader, sentenced to three additional years in prison.

6 Hitler, in address to Reichstag, asked for "unconditionally guaranteed peace" but declared "this statement will have been my last"; he repeated his demand, "not backed by force," for return of colonies, and said new Polish state would be set up to solve Jewish problem and the problem of German minorities; he announced German casualties in Poland were 10,572 killed, 30,322 wounded, 3,404 missing.

Daladier said, in first reply to Hitler's Reichstag speech: "We must go on with the war."

Chungking celebrated defeat of Japanese in vicinity of Changsha as "biggest victory of war"; Japanese later conceded defeat.

7 Repatriation program for Germans in Baltic states initiated by Reich's ministers to Latvia and Estonia.

Finland called up additional reservists as U.S.S.R. issued invitation for conference at Moscow; Swedish Gov't asked Parliament for additional appropriations for defence.

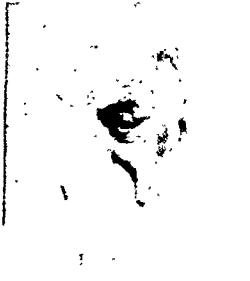
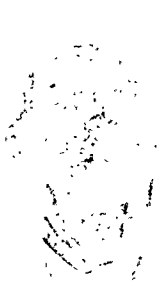
8 German commission and ships arrived at Riga to hasten evacuation of Germans from Latvia and Estonia as Russian troops prepared to occupy military bases on Baltic.

Russia announced its mutual economic program with Germany would "be realized by both parties at a rapid pace and on a large scale."

Virginio Gayda, Italian press spokesman, asserted Italy would

The pictures on this page are, left to right:

LLOYD GEORGE.....Oct. 3
RAEDER.....Oct. 5
GREW.....Oct. 19
LEOPOLD.....Nov. 7
THYSEN.....Nov. 20



OCTOBER—Continued

continue policy of neutrality even if Britain and France rejected Hitler's offer of peace.

Japanese entered Shekki, on delta of Canton river.

New York Yankees defeated Cincinnati Reds in fourth straight game (2-1, 4-0, 7-3, 7-4) to win baseball world's series.

9 Finland continued to mass troops on eastern border as its representative, Juhu Paasikivi, entrained for Moscow; Sweden began construction of first air-raid shelters and ordered 100,000 reservists to remain in service.

Italian newspaper of Ferrara attacked Russian leaders as "sanguinary criminals" and "buffoons," and declared Italians are "born anti-communists."

10 Third Baltic pact, with Lithuania, concluded at Moscow; U.S.S.R. ceded Vilna in exchange for practically unlimited rights to establish military bases on Lithuanian soil; Lithuania ratified pact October 14.

France would not lay down her arms until she had "certain guarantees of security which will not be put in doubt every six months," said Daladier in formal reply to Hitler's proposals of October 6.

Civilian evacuation of Helsinki and Viborg and mobilization of fleet ordered by Finnish Gov't.

Motion of Sen. Charles W. Tobey (N.H., R.) to separate shipping and embargo provisions of Neutrality bill defeated by U.S. Senate, 65 to 26.

Estonian cabinet resigned.

11 Anglo-Soviet trade treaty concluded; it provided for exchange of Russian timber for British rubber and tin.

Pres. Roosevelt dispatched personal note to Pres. Kalinin,

urging U.S.S.R. not to disrupt its friendly relations with Finland.

British War Secretary Hore-Belisha announced transport of 158,000 troops and 25,000 tanks and vehicles to France in first five weeks of war.

Finnish Foreign Minister Erkko said nation would not sign a Russian-dictated agreement.

12 Definite rejection of Hitler's peace proposals announced by Chamberlain, who repeated that "no reliance can be placed upon the promises of the present German Gov't."

Dutch member of "Bre-men's" crew revealed at Amsterdam that German liner was safe at Murmansk, U.S.S.R.; British reported capture of Nazi liner "Cap Norte."

William Green re-elected unanimously for 15th consecutive term as president of A.F. of L.

13 In his second broadcast on neutrality, Col. Lindbergh advocated Pres. Hoover's plan of selling only "defensive" arms to belligerents; he also said U.S.A. should "demand the freedom of this continent and its surrounding islands from the dictates of European powers" and criticized Canada for entering war.

Sinking of three German submarines announced by British Admiralty.

Dr. Otto Dietrich, Nazi party press chief, reputedly said that only U.S. intervention for peace could save Europe from the "most gruesome blood bath in history"; Pres. Roosevelt indicated U.S.A. would not act on such semi-official suggestions.

14 British battleship "Royal Oak" sunk at Scapa Flow by German submarine which penetrated defences of bay; 810 died, 424 were rescued; Germans claimed battle cruiser "Repulse" was torpedoed in same raid.

Japanese air base at Hankow bombed by Chinese planes.

15 Soviet warships anchored in Tallinn bay.

New York city's \$40,000,000 North Beach airport opened.

16 Nazi planes raided British naval base at Rosyth on Firth of Forth; London admitted slight damage to cruiser and destroyer and casualties of 15 dead, but claimed four enemy planes shot down.

Germans launched major offensive along western front and drove French back across border at Apache.

Members of Hungarian "Death Legion," outlawed Nazi organization, seized after suspected attempt to assassinate legislators and seize power.

Mayor Maury Maverick of San Antonio, Texas, indicted on charges of improper payment of poll taxes; later acquitted.

Madrid restored as capital of Spain.

17 Russo-Turkish negotiations broke down; Turkish Foreign Minister Saracoglu left for Ankara October 18.

Scapa Flow raided twice by Nazi planes; London announced damage to training ship "Iron Duke" and Berlin claimed hits also on second warship.

Pres. Kalinin's reply of October 16 to Pres. Roosevelt's message of October 11 revealed in Washington; note described Russian negotiations with Finland as entirely friendly.

Elmer F. Andrews resigned as U.S. Wages and Hours administrator; he was succeeded by Col. Philip Fleming.

18 Kings of Sweden, Norway, and Denmark and Pres. Kyosti Kallio of Finland opened four-power conference at Stockholm to consult on possible concerted action in case of Russian invasion of Finland; Pres. Roosevelt, in message to King Gustav of Sweden, declared American nations' support of "principles of neutrality and order under law for which the nations represented at the Stockholm conference have . . . taken a consistent stand."

Belligerent submarines barred from U.S. ports and territorial waters by proclamation of Pres. Roosevelt.

Dominion status for India by gradual constitutional steps after war described by Viceroy Linlithgow as British objective.

19 Allied-Turkish pact of mutual assistance signed at Ankara; it provided for "collaboration" in the event of war in the Mediterranean or war resulting from Allies' guarantees to Greece and Rumania; protocol specified that Turkey should not be obliged to fight Russia.

Formal annexation of 20,000 sq. mi. of Polish territory taken from Germany by treaty of Versailles announced in Berlin; decree was signed October 8, effective November 1.

U.S. Ambassador Joseph C. Grew, in speech at Tokyo, sharply criticized Japanese infringements of American rights in China.

Four-power Scandinavian conference ended at Stockholm; communiqué reaffirmed neutrality and thanked U.S.A. for message of good-will toward four nations.

20 Polish Gov't in France announced protest to Lithuania against annexation of Vilna.

Japanese flyers completed round-the-world flight at Tokyo.

21 Editorial in Izvestia of Moscow declared Allied-Turkish pact had "serious political significance" and warned against attempts to drive a wedge between Germany and U.S.S.R.

German planes made first attack on British convoy in North Sea; Britain claimed raid was thwarted and four planes were shot down.

German patrol vessel "Este 701" exploded in mine field off island of Moeen, Denmark; 50 of crew killed.

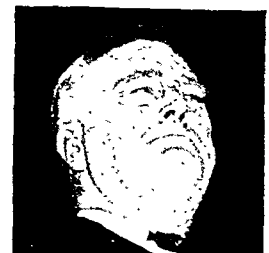
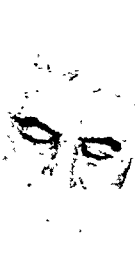
22 Withdrawal of French troops from all but scattered posts in German territory reported in Paris.

India Congress ordered eight provincial ministries to resign as protest against Britain's policy of postponing grant of Dominion status.

Goebbels accused Winston Churchill of deliberately sinking "Athenia" and called attention to U.S. passenger's affidavit that ship was to be outfitted as raider and was sunk September 4 by British destroyers.

The pictures on this page are, left to right:

HIMMLER.....Nov. 21
STALIN.....Nov. 29
RYTI.....Dec. 1
DEWEY.....Dec. 1
ROOSEVELT.....Dec. 23



OCTOBER—Continued

23 Seizure of U.S. ship "City of Flint" as contraband carrier by German crew on October 9 announced; Germans took vessel with crew of 41 to Tromsø, Norway, October 20, then to Murmansk, U.S.S.R.; prize crew was later revealed to be from pocket battleship "Deutschland."

Earl Browder, sec'y of U.S. communist party, indicted on charge of using false U.S. passport.

Offices of Louisiana attorney-general and his assistant seized by State troops on orders of Gov. Earl K. Long.

U.S. Supreme Court refused to review anti-trust suit against American Medical Association before trial of case by Circuit Court of Appeals.

24 "Germany will now fight to the finish," asserted German Foreign Minister von Ribbentrop at Danzig; he said that no possible differences should arise between U.S.A. and Germany.

Minimum U.S. wages in interstate industry raised to 30 cents per hour and maximum working hours per week without overtime pay lowered to 42; approximately 700,000 workers were affected.

25 German prize crew of "City of Flint" released from internment at Murmansk.

Gov't of Premier Duplessis of Quebec, opponent of conscription, defeated by Liberals in landslide vote.

26 Russia notified London that it would not recognize validity of British contraband list.

German pocket battleship "Deutschland" had eluded British blockade to raid shipping in Atlantic, Prime Minister Chamberlain disclosed in House of Commons; raiding by "Admiral Scheer" in Atlantic admitted by naval authorities next day.

Release of "City of Flint" demanded of U.S.S.R. by U.S. State Dept.

1939 Nobel prize in physiological medicine awarded to Prof. Gerhard Domagk of Germany for his discovery of prontosil; deferred 1938 prize awarded to Dr. Corneille Heymans of Belgium.

Josef Tiso elected first president of Slovak republic.

27 Repeal of arms embargo voted by U.S. Senate, 63 to 30.

Soviet rule for western Ukraine approved unanimously by assembly at Lwow.

Lithuanian troops began occupation of Vilna.

28 Riots in Prague marked observance of 21st anniversary of Czechoslovakia's founding.

"City of Flint" left Murmansk, manned by German crew.

29 Soviet troops entered Latvia to occupy military and naval posts.

Peruvian flyers began non-stop flight between New York city and Lima; they were forced down in Ecuador next day.

30 Horrors of Nazi concentration camps described in British *White Paper* published at London.

Mixed Claims commission awarded U.S. litigants \$50,000,000 for damages in Black Tom and Kingsland explosions.

Winnie Ruth Judd, escaped murderess, captured at Phoenix, Ariz.

31 New foreign policy of U.S.S.R. outlined by Premier-Foreign Minister Molotov at extraordinary session of Supreme Soviet; he accused Allies of prolonging war, defended Russian invasion of Poland, deplored the "experience of Versailles," berated the U.S. Gov't for intervening in Finnish negotiations and for supporting repeal of arms embargo, conciliated Japan, and divulged Russia's "proposals" to Finland, viz., islands in the Gulf of Finland, naval base at the entrance to the gulf, and a strip of territory on the Karelian isthmus north of Leningrad in exchange for part of Soviet Karelia.

Six Italian cabinet ministers, chiefs of army and air force, and Party Sec'y Achille Starace removed from office by Mussolini; Ettore Muti became new party sec'y, and Marshal Rodolfo Graziani chief of staff of the army.

New York World's Fair of 1939 closed with paid admissions of 25,814,953.

NOVEMBER

1 Finland declared it would not accede to "proposals" set forth in V. Molotov's speech of preceding day.

Admission of Polish Western Ukraine into U.S.S.R. voted

unanimously by Supreme Soviet; Polish White Russia was admitted next day.

Chalcedon became champion horse of 1939, defeating Kayak II by half length in Pimlico Special.

2 House of Representatives voted repeal of arms embargo, 243 to 181; conference report was approved next day by Senate, 55 to 24, and by House, 243 to 172.

American opposition to Japanese expansion in China scored as unjust by Japanese Institute of the Pacific in reply to Ambassador Grew's speech of October 19.

Strike against coastwise shipping lines called in New York city.

3 Molotov's references of October 31 to U.S.A. characterized by President Roosevelt as bad manners.

German internal loan of 500,000,000 marks oversubscribed.

Gen. Manuel Avila Camacho nominated as presidential candidate of Mexican Revolutionary party.

4 Bill repealing U.S. arms embargo and substituting "cash-and-carry" trade with belligerents signed by Pres. Roosevelt; proclamation forbade U.S. ships to enter waters around Great Britain and Ireland, English channel, North Sea south and west of Bergen, Baltic sea, and Bay of Biscay except northern Spanish coast.

"City of Flint" released to American crew by Norway, which interned German prize crew for entering port of Haugesund without permission; Germany protested to Norwegian Gov't; ship sailed to Bergen.

5 Breakdown of talks with Indian leaders over future political status of country announced by Viceroy Linlithgow.

Marshal Pietro Badoglio reconfirmed as chief of Italian armed forces; increase in Italian Army ordered by Mussolini.

Norway rejected Nazi demand for return of "City of Flint" and release of prize crew.

Canadian C.I.O. declared complete independence from U.S. parent organization and pledged war aid to Dominion.

6 A decadent capitalism was responsible for European war, said V. Molotov, who declared U.S.S.R. would pursue its "tested policy of peace . . . unswervingly"; Comintern's annual dec-

laration next day associated war blame with German as well as French and British rulers.

Nine of France's U.S. warplanes shot down 9 of 27 invading Nazi planes, announced French general headquarters.

7 King Leopold of Belgium and Queen Wilhelmina addressed another joint offer of mediation to Germany, Britain, and France.

Old-age pension plans defeated by decisive majorities in Ohio and California.

Transfer of U.S. ships to Panamanian registry to evade provisions of new neutrality law held up by Pres. Roosevelt.

Virginio Gayda, Mussolini's editorial spokesman, assailed "false accusations" of Comintern concerning war, derided Molotov's claim that Russia was working for peace, and said "there is no definite accord between Moscow and Berlin."

Trial of Herschel Grynszpan, young Polish Jew, for slaying of German diplomat in Paris Nov. 7, 1938 postponed for duration of war.

Independence for India termed "impossible" by Marquess of Zetland, sec'y of State for India.

8 Apparent attempt to assassinate Hitler and Nazi leaders failed when he left Buergerbraeu hall, Munich, with his party shortly before time bomb exploded, wrecking hall and killing 8; reward of \$200,000, later increased to \$360,000, offered for clues concerning conspirators; before leaving, Hitler had commemorated 16th anniversary of unsuccessful Nazi putsch with a militant speech against Britain.

Unsuccessful conspiracy to start revolt in Afghanistan September 7 revealed in India.

9 Ernest O. Lawrence of U.S.A. received 1939 Nobel prize in physics; prize in chemistry awarded jointly to Adolph Butenandt of Germany and Leopold Ruzicka of Switzerland; deferred 1938 prize in chemistry went to Richard Kuhn of Germany.

10 Americans advised by U.S. Consulate at Amsterdam to leave the Netherlands.

Breakdown of Finnish-Russian parleys announced in Moscow.

1939 Nobel prize for literature awarded to Frans Eemil Sillanpaa, Finnish novelist.

NOVEMBER—Continued

11 American shipping to Norway resumed.

12 Reply of King George VI to Dutch-Belgian offer of mediation in war insisted upon guarantees against recurring German aggression; reply of Pres. Lebrun of France declared basis of peace should be "reparation of the injustices . . . imposed upon Austria, Czecho-Slovakia, and Poland."

Withdrawal of British troops from North China announced in London; France announced similar move November 14.

13 German envoys to Belgium and Netherlands instructed to assure two countries that Reich intended to respect their neutrality; Dutch Premier de Geer told countrymen that he believed Germany would live up to its pledge.

Shetland islands bombed twice by German planes.

14 British Admiralty announced loss of destroyer which struck German mine November 13; vessel was later revealed to be "Blanche."

Byrd expedition left Boston on first leg of journey to Antarctica.

Maj. Gen. Thomas Q. Ashburn, president of U.S. Inland Waterways Corporation, ousted by Sec'y of Commerce Hopkins because of disagreement on policy.

16 General Motors Corp. and 3 subsidiaries convicted of violating anti-trust act; 17 executives of companies were acquitted.

Al Capone, former Chicago gangster, released from prison.

17 Nine Czech students executed by Nazi Elite Guards at Prague for taking part in anti-German riots; three more Czechs were shot next day; University of Prague closed for three years.

Allied Supreme Economic council created in London to co-ordinate Franco-British purchasing, shipping, and blockade activities.

Two-week strike of longshoremen in New York city ended.

Capture of Pakhoi in South China announced by Japanese.

Rome radio station warned U.S.S.R. not to attempt invasion of Balkans.

18 Dutch liner "Simon Bolivar" struck mine off Har-

wich, England, and sank with estimated loss of 100 lives.

Ten-hour working day without additional pay announced in Germany.

19 Unrestricted German mine warfare charged by Great Britain as five more merchant ships went down off east coast of England; 9 other ships were similarly sunk in next 2 days.

Prosecution of labour unions under anti-trust laws threatened by Ass't Att'y-General Arnold.

Hindu-Moslem riots broke out in Sukkur, India.

20 Chiang Kai-shek elected president of Chinese Executive Yuan to succeed H. H. Kung, who became vice-president.

Fritz Thyssen, German industrialist, announced that his opposition to Nazis' war policy had obliged him to flee to Switzerland.

Loans to small businesses promised by RFC if private banks withheld such credit.

21 German exports, whether on Reich's or neutral ships, would be seized in retaliation for Germany's mine laying in North Sea, announced Prime Minister Chamberlain; Japanese liner "Terukuni Maru" sunk by mine off east coast of England.

Two British Intelligence Service officers and a German were said by Heinrich Himmler, chief of Nazi Gestapo, to be instigators of Buergerbraeu explosion November 8; all were arrested within a few hours and the German later confessed crime, said Himmler, who also accused Otto Strasser, head of anti-Nazi "Black Front," as "brains" behind plot.

New Lithuanian cabinet headed by Antanas Merkys formed.

Proposed transfer of U.S. ships to Panamanian registry was a "closed chapter," announced White House.

Angers, France, selected as new capital of Poland's expatriate Government.

22 Sinking of British destroyer "Gipsy" by mine off east coast of England November 21 announced by Admiralty; 40 of crew lost; ship was Britain's seventh naval loss of war.

23 British armed merchantman "Rawalpindi" sunk by German pocket battleship "Deutschland" and another warship off southeast coast of Iceland in first naval battle of war; loss of life was estimated as 259;

Admiralty announcement was delayed until November 26.

Sowing of parachuted magnetic mines by German seaplanes in estuary of Thames confirmed by British Admiralty; Port of London Authority officials revealed next day that port had been closed for few hours until mines were swept up.

Premier Argetoianu of Rumania resigned; George Tatarescu formed cabinet next day.

Netherlands and Belgium protested seizure of German exports on neutral ships; Italy and Japan lodged protests next day.

24 Plan to cut 1940 deficit by more than half for 1941 fiscal year divulged by Pres. Roosevelt, who also announced likely increase of \$500,000,000 in appropriations for national defence.

Capture of Nanning announced by Japanese army.

New British cruiser "Belfast" damaged by torpedo or mine in Fifth of Forth November 21, Admiralty announced.

25 Berlin claimed direct hits on four British warships during air attack in North Sea.

26 Withdrawal of Finnish troops 20 to 25 km. behind fortified border on Karelian isthmus demanded by U.S.S.R. after alleged incident in which three Soviet troops and officer were killed; Finland denied clash next day and said it would agree to proposal only if Soviet troops withdrew from border also.

Organization of Allied economic co-ordinating committee headed by Jean Monnet, French-born British economist, announced in London and Paris.

27 Order in council for blockade of German exports signed by King George; enforcement of order began December 5.

28 Finnish-Soviet non-aggression pact denounced by U.S.S.R.; Russians charged new provocative border incidents.

Strike of C.I.O. workers at Chrysler plants in Detroit ended by agreement after 54 days; new contract was ratified by unions next day.

Vindictive peace disclaimed by Chamberlain as Allied war aim.

29 U.S.S.R. severed diplomatic relations with Finland; United States offered to mediate.

Fritz Kuhn convicted of larceny and forgery; he was sentenced December 5 to 2½-5 years in prison.

Joseph Stalin branded as lie statement attributed to him that European war "should last as long as possible."

Rumanian Foreign Minister Gafencu rejected Hungarian Foreign Minister Csaky's suggestion that Rumania consider return of Transylvania.

30 Russian troops began invasion of Finland shortly after 9 A.M.; Pres. Kallio declared "state of siege"; scores killed in air raids on Helsinki, Viipuri, and other cities; Soviets announced capture of Petsamo (Petschenga) and four islands in Gulf of Finland.

Premier Daladier granted complete power to rule by decree for duration of war; French Senate approved move next day.

Dino Grandi named president of Italian Chamber of Fasces and Corporations.

DECEMBER

1 Finnish Premier Cajander resigned despite vote of confidence and was succeeded by Risto Ryti; new Soviet puppet "People's Government" set itself up at Terijoki and was recognized by U.S.S.R.; advance of Russian Army checked in Karelian isthmus; Finns announced sinking of Russian cruiser and disabling of warship "Kirov."

Pres. Roosevelt denounced Soviet invasion as wanton and lawless; he also requested both belligerents not to bomb open cities.

Thomas E. Dewey opened campaign for Presidency.

Harold D. Jacobs appointed temporary Wage-Hour administrator.

2 Puppet Terijoki Gov't signed compact with U.S. S.R. ceding bases and territory to latter; Finns reported recapture of Petsamo and successful counter-attacks on Karelian isthmus south of Mannerheim line.

3 New Finnish cabinet declared intention of seeking pacific settlement of war without sacrificing vital interests; strong resistance to Soviet troops reported along eastern front.

League of Nations Council summoned to meet December 9 in response to Finland's appeal.

4 Moscow refused Finland's proposal to negotiate, and announced U.S.S.R. would not

DECEMBER — Continued

attend League of Nations Council meeting; Finns announced capture of 1,500 Soviet troops north of Lake Ladoga; *Pravda* admitted Russian advance had been delayed by land mines.

5 Finland claimed destruction of 60 Russian planes in raid on Soviet air bases near Murmansk but admitted short retreats on Karelian isthmus and in vicinity of Suojarvi.

Partial mobilization decreed by Sweden; territorial waters in Baltic mined.

Plan for using Finland's war debt payment of \$234,693 December 15 to aid nation in repelling invasion announced by Pres. Roosevelt; Herbert Hoover announced organization to raise funds for Finnish refugees.

6 Official journal of Comintern warned Rumania to negotiate anti-aggression pact similar to those signed by Baltic states; the article was officially repudiated December 8.

Ruin of Reich's overseas trade admitted by German economic and colonial expert.

Secretary of German consulate in New York city found beaten to death.

Col. Fulgencio Batista retired from Cuban Army to become candidate for Presidency.

7 Blockade of Finland announced by U.S.S.R.

8 U.S.A. protested to Great Britain against seizure of German exports on American ships and warned that such action might lead to claims for damage.

Admiral James O. Richardson appointed commander in chief of U.S. fleet.

Italian Fascist Grand Council declared Rome-Berlin axis was unimpaired, challenged Allies' right to interfere with Italian overseas trade, and warned against aggression in Balkans:

Turkish press charged Franz von Papen, German ambassador, with propaganda activities to stir up Russo-Turkish enmity.

Manuel Prado inaugurated as President of Peru.

10 Credit of \$10,000,000 granted Finland by U.S. Export-Import Bank.

Tass, official Soviet news agency, published report that Germany was shipping arms to Finland; report was officially denied in Berlin.

Plea for active help from other nations broadcast by speaker of Finnish diet.

11 League of Nations asked U.S.S.R. to suspend hostilities in Finland and submit dispute to negotiation; reply requested within 24 hours.

Four companies of Soviet troops annihilated near eastern border, said Finnish communiqué; penetration of Russians as far as 60 mi. in certain sectors admitted.

Investigation of National Labor Relations Board opened in Washington.

Evidence in U.S. criminal trials obtained by wire-tapping was barred by Supreme Court.

12 U.S.S.R. refused "to take part in discussion of the Finnish question" with the League of Nations.

"Bremen" returned to home port from Murmansk after eluding British submarine.

British and French currencies pegged together at 176½ francs to pound.

Finns claimed 2,000 Russians slain in Soviet offensive to cut nation in two.

Swedish Foreign Minister Sandler, object of Nazi and Russian criticism, dropped from new coalition cabinet, which took office December 13.

13 German pocket battleship "Admiral Graf Spee" disabled after running battle with British cruisers "Ajax," "Achilles," and "Exeter;" it took shelter in harbour of Montevideo, Uruguay, with 36 dead; "Exeter" was also badly damaged; British casualties later announced as 72 dead.

Russia named as aggressor by committee of 13 appointed by League of Nations Assembly.

Marcel Pilet-Golaz elected President of Swiss Confederation for 1940.

14 U.S.S.R. expelled from League of Nations.

16 "Admiral Graf Spee" ordered by Uruguayan Gov't to leave by 8 P.M. December 17.

John N. Garner announced candidacy for President.

17 On Hitler's orders, "Admiral Graf Spee" was blown up by her commander outside harbour of Montevideo.

First Canadian troops arrived in Great Britain.

18 British and German planes met in big air battle over Heligoland Bight; Berlin claimed 34 British ships shot down with only two German planes lost; London placed own losses at 7 and Nazis' at 12.

Winston Churchill claimed sinking of German cruiser in mouth of the Elbe, damaging of two others and destruction of U-boat by two British submarines.

Argentina announced it would intern crew of "Admiral Graf Spee."

U.S.S.R. completed occupation of Finnish corridor to Arctic ocean.

19 German luxury liner "Columbus" scuttled by own crew 450 mi. off U.S. coast when intercepted by British destroyer "Hyperion;" crew of 577 was landed by U.S. cruiser "Tuscaloosa" at Ellis island next day.

German freighter "Arauca" took refuge at Ft. Lauderdale, Fla., after pursuit by British cruiser "Orion."

20 Hans Langsdorff, commander of "Admiral Graf Spee," committed suicide.

21 Hospital district of Helsinki destroyed by Russian bombers on Stalin's 60th birthday.

22 Russians continued retreats on northern and eastern Finnish fronts; unofficial estimates placed Soviet casualties at 30,000 for first three weeks of war.

23 Roosevelt named Myron C. Taylor his personal representative at Vatican with rank of ambassador without portfolio; President also asked Pope Pius XII and U.S. Jewish and Protestant leaders to work for world peace.

All American republics protested jointly to France, Great Britain, and Germany against violation of 300-mi. "safety zone" around hemisphere.

24 Five-point peace plan of Pope Pius XII called for guarantee of all nations' independence, disarmament, return to international morality, and meeting of "just demands of nations and . . . minorities."

Irish Republican Army members raided magazine of Dublin fort.

25 Finnish troops crossed Russian border for first time in drive to sever Murmansk railway; Viipuri suffered heavy long-range artillery bombardment.

26 British announced new mine field along length of eastern coast approximately 30-40 mi. wide.

27 Sweden and Great Britain concluded wartime trade pact.

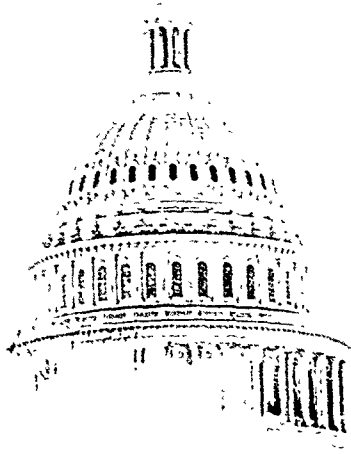
28 Pope Pius XII paid formal visit to King Victor Emmanuel.

30 Charles Edison appointed U.S. Sec'y of Navy.

Finns routed Russians in two-day battle north of Lake Kianta; entire Russian division reported annihilated.

31 Disputes over fishing grounds and Manchoukuoan railroad settled by two Russo-Japanese pacts.

Total German and Allied casualties of war estimated by French at 9,604. (Jan. 1, 1940).



Abbott, Grace (1878-1939), American social worker, was born November 17 at Grand Island, Neb., and graduated from the college there in 1898. For several years she taught in the high school at Grand Island, then moved to Chicago where she became associated with the late Jane Addams as a resident at the Hull House. This experience crystallized her determination to enter social work, and to devote her career especially to the problems of children. President Wilson appointed her director of the child labour division of the U.S. Children's Bureau in Washington in 1917, and from 1921 to 1934 she was chief of the bureau. In this position she exerted a powerful influence on public opinion in favour of the child labour amendment and other social legislation. Her articles on the training of children, published in the bulletins of the Children's Bureau and in current periodicals, attracted millions of readers. In 1934 she became professor of public welfare at the University of Chicago. Several months before her death in Chicago on June 19 she completed her two-volume *The Child and the State*. See also *Encyclopædia Britannica*, vol. 1, p. 22.

Abe, Nobuyuki (1875-), Japanese prime minister, was born in Nov. 1875 at Ishikawa-ken and graduated from the Military Officer's school in 1897. He entered military service and became successively an instructor of military tactics at the Military academy, military attaché to Austria, director of the national bureau of military affairs, chief secretary of the Japanese Military council, army vice-minister, and acting army minister. In 1932 he was appointed commander of the Taiwan army. Though he possesses perhaps an unrivalled knowledge of Japanese military affairs, he had never held a high political office when the emperor commanded him to form a cabinet Aug. 28, 1939, after the resignation of Prime Minister Kiichiro

Hiranuma (*q.v.*) had been precipitated by announcement of the Soviet-German pact of non-aggression. Abe completed his cabinet the next day and retained for himself temporarily the portfolio of foreign affairs. Almost the first action of the new cabinet was the issuance of a statement that Japan "does not intend to become involved" in the European war. Abe also indicated that his Government would pursue the Chinese "incident" to its conclusion, and would adopt a foreign policy of rigid independence. He resigned Jan. 14, 1940.

Aberdeen and Temair, Ishbel Maria, DOWAGER MARCHIONESS OF (1857-1939) was the widow of the first Marquess of Aberdeen and Temair, Governor General of Canada and twice Lord Lieutenant of Ireland, who died in 1934. With her husband she was an influential leader of English liberalism during the ministries of Gladstone and afterward. In her earlier years she was a prominent suffragist and participated frequently in Scottish political campaigns. Later she became internationally known for her philanthropic activities. When her husband became Lord Lieutenant of Ireland in 1886 she became president of the Women's National Health association, which established tuberculosis sanatoria throughout Ireland. When he was appointed Governor General of Canada she established the Victorian Order of Nurses there. For 38 years she was president of the International Council of Women. She wrote a joint autobiography with her husband, *We Two* (1925) which was widely read in Great Britain and the United States. Other volumes were *More Cracks with We Two* (1929) and *The Musings of a Scottish Granny* (1936). She died at Rubislaw, Aberdeenshire, Scotland, on April 18.

Abyssinia: see ITALIAN COLONIAL EMPIRE.

Academic Freedom.

The major scholarly associations in the United States of a general character have established academic freedom committees. This list, Jan. 1, 1940, included the American Association of University Professors, the American Federation of Teachers, the National Educational Association, and the Progressive Education Association. On Jan. 11, 1940, the Association of American Colleges at its annual meeting adopted in amended form a statement of principles concerning academic freedom and tenure which had been drafted by a joint conference of committees of the American Association of University Professors and the Association of American Colleges. Although this statement as amended represents a genuine advance over previous formulations, it remains to be seen whether the American Association of University Professors will be satisfied with the changes made by the college presidents. The "full freedom" of the teacher "in research and in the publication of results, subject to the adequate performance of his other academic duties," is recognized. Both groups, moreover, agree that the teacher should have freedom in discussing his subject in the classroom and that "when he speaks or writes as a citizen he should be free from institutional censorship or discipline." The American Association of University Professors has wished, however, the acceptance of the specific probationary periods outlined by the joint committee. Under this plan an instructor or a person of higher rank would normally receive permanent tenure after serving a maximum of six years. Beyond this period, the termination of appointments would be for "adequate cause" or for extraordinary and proven financial exigencies. Dismissal would be only after a hearing at which the teacher is afforded an adequate opportunity to defend himself.

The Association of American Colleges voted to leave it to each college to define "with great care" the probationary period, although it accepted the right of an aggrieved teacher to an adequate hearing. Another disagreement has been over the refusal of the Association of American Colleges to favour the provision that the individual teacher should be the sole judge of whether he had, outside of the classroom, used "appropriate restraint" in his utterances.

The American Association of University Professors reported in 1939, 104 cases of alleged violation of academic freedom. Outstanding 1939 cases in which infringements to academic freedom or tenure were found include those at the University of Tennessee, John B. Stetson university, St. Louis university, Montana State university, and West Chester State Teachers college. The administrations of all these institutions were placed on the censured list of the American Association of University Professors. The State Board of Higher Education of North Dakota was removed from the Association's censured list after that board had reinstated faculty members of the North Dakota Agricultural college.

(C. E. WA.)

Academy of Arts and Letters, American: *see* AMERICAN ACADEMY OF ARTS AND LETTERS.

Academy of Arts and Sciences, American: *see* AMERICAN ACADEMY OF ARTS AND SCIENCES.

Academy of Political and Social Science, American: *see* AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE.

Accidents: *see* DISASTERS; INSURANCE. **AUTOMOBILE:** *Great Britain;* **MEDICINE:** *Motor Accidents;* **PSYCHOLOGY, APPLIED:** *Accidents;* **SHIPPING, MERCHANT MARINE;** **TRAFFIC ACCIDENTS.**

"Achilles": *see* EUROPEAN WAR; SUBMARINE WARFARE.

Actors and Acting: *see* THEATRE.

Adams, John Taylor

(1862–1939), U.S. political leader, was born at Dubuque, Ia., on December 22 and entered a manufacturing business in 1881. His

political career started in 1908, when he managed a senatorial campaign; four years later he managed William Howard Taft's campaign in Iowa, and from 1912 to 1924 he was a member of the Republican National Committee for Iowa. From June 1921 to June 1924 he was chairman of the Republican National Committee. He died at Dubuque on October 28.

Aden.

Aden Colony, including Perim island, etc., area 80 sq.mi.; pop. (1931) 46,638. Aden Protectorate, including Sokotra, area 112,200 sq.mi.; population (estimated) 600,000. Governor, Lt.-Col. Sir Bernard Rawdon Reilly, K.C.M.G., C.I.E., O.B.E.; language: English and Arabic; religion: Mohammedan.

History.—Although Aden is the youngest crown colony (1937) it has been a British possession since Jan. 19, 1839. The centenary was celebrated. In the Protectorate the rule of law and economic order extended steadily, especially in the territories of the Qua'iti and Kathiri Sultans. For his services in the promotion of peace and the improvement of transport, irrigation and education in the Hadrahmaut the Seiyid Bubakr was made Commander of the Order of the British Empire. The outbreak of war found the various rulers of the Protectorate in full sympathy with the Allied cause. The importance of Aden itself, as a naval and military and to some extent an air base, is likely to be accentuated.

Production 1938-39: tobacco (approx. value of crop) Rs. 500,000; salt 262,994 tons; (export) 248,784 tons. External trade 1938 (merchandise and treasure on private account): imports, by sea Rs.6,78,60,400; by land Rs.29,40,602; exports, by sea Rs.3,41,45,281; by land Rs.15,95,929; treasure: imports Rs.1,23,69,439; exports Rs.72,50,784.

Finance 1938-39: revenue £148,586; expenditure £127,963; currency, legal tender: rupee (Rs.1)=1s.6d.

Communication: shipping (1938), 2,079 merchant vessels entered; total tonnage 8,650,411 net tons; motor vehicles registered (Sept. 30, 1939) 733 cars and taxis, 207 commercial vehicles.

Adjusted Compensation. On May 19, 1924, the World War Adjusted Compensation Act was passed by the Congress of the United States providing for the adjustment of the pay of veterans of the World War. In substance it bestowed basic service credit of \$1.00 for each day's service in the United States and \$1.25 for each day's service overseas, with deduction on account of the \$60 bonus previously authorized and limited to a maximum of \$500 for home service and \$625 for overseas service. If service credits amounted to no more than \$50, veterans were paid in cash, payments numbering 176,872 and aggregating \$5,537,821.91 having been paid under this provision of the statute.

In the case of deceased veterans, service credits were payable to their dependents and such payments amounting to \$48,448,582.53 have been made on 146,825 veterans' cases. To living veterans whose service credits exceeded \$50 there have been issued 3,789,783 adjusted service certificates, the face values of which total \$3,708,546,587.00.

These certificates having loan privileges are, in essence, paid-up 20-year endowment insurance policies, the maturity values thereof approximating two and one-half times the service credit. A sum of \$237,596,330.59 has been paid on 240,864 certificates because of maturity having been occasioned by the deaths of veterans.

Legislation enacted Jan. 27, 1936 made the face values of adjusted service certificates, less any outstanding loans and interest accrued prior to Oct. 1, 1931, payable as of June 15, 1936, upon application. The face values of the 3,494,607 adjusted service certificates upon which certifications have been made totalled \$3,424,119,301.00, and the amount certified as payable after deducting outstanding liens was \$1,911,587,215.59.

(F. T. H.)

Adult Education: *see* EDUCATION, ADULT.

On April 30, 1939, television was publicly introduced by NBC. In November, the Federal Communications Commission Television Committee advised caution in commercializing television, but



WHILE DANCE has been a controversial "X-rated" medium for a half-century, it has been the most successful of the earth's oldest entertainments. It has always been less than a gear of culture, given its roots in the carnal.

But the more successful dance shows of the 1970s, like the disco and night club, are strange, like a more violent & different sort of rock 'n' roll. As they are more about the body, they are more about the body's pleasures than the mind's. They are more about the body's pleasures than the mind's.

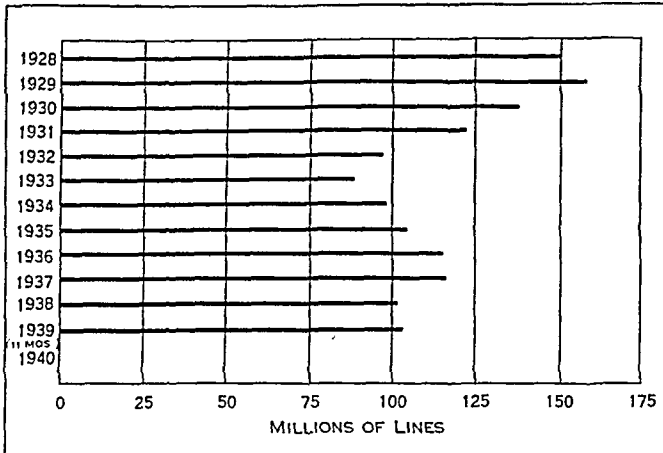
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CORNING
—means—
Research in Glass

THIS PRIZE-WINNING U.S. ADVERTISEMENT of the 1938 Annual Advertising Awards, announced in Feb. 1939, stresses "institutional" copy

Legislation.—In the United States, application of existing laws caused more immediate apprehension among national advertisers than new measures added to Federal statute books in 1939. The Wheeler-Lea amendment to the Federal Trade Commission Act, and the Food, Drug and Cosmetic Act brought about drastic curtailments in copy, and the wide discretion vested in both the Federal Trade Commission and the Food and Drug Administration was the element which advertisers found most troublesome.



NEWSPAPER ADVERTISING (total linage in 52 cities of the United States): average per month. Compiled by Media Records, Inc.

An amendment was passed to the Food, Drug and Cosmetic Act making mandatory a six months' extension of labelling provisions, to afford manufacturers ample time to comply with the law. The Federal Trade Commission announced that, thereafter, agencies would be held jointly liable with clients in cases involving alleged false or misleading copy.

From an advertising standpoint, the charge by the Federal Trade Commission that the use of the Good Housekeeping "Seal of Approval" violated Federal legislation was one of the most interesting legal actions introduced during 1939. The case was described as one of the most important legal battles in the history of advertising.

British advertising was affected, in some lines, by legislation enacted as a result of the war. Producers of gasoline, tea, and margarine were forced to pool their products, with the result that brand names could not be used and advertising was ineffective. Later in the year, this restriction was removed in the case of margarine and the British Government retained the right to apply such legislation to other products.

Research.—As in previous years, activities in advertising research carried on by specialized organizations, publications, and advertisers in the United States, continued to increase. A joint study was continued by the Bureau of Advertising of the American Newspaper Publishers Association and the Advertising Research Foundation to determine current newspaper reader habits.

Qualitative measurements of the effect of radio programs upon audiences were improved and figures on radio ownership, listening habits, and location of receiving sets were made available to advertisers and advertising agencies.

Late in September, the results of a four-year copy-testing study were issued in book-form by the Advertising Research Foundation.

Co-operative Advertising in the United States showed a marked increase, both as to scope and expenditure. Many new groups joined co-operative movements for the first time. Among the outstanding co-operative campaigns in 1939 was the "Parade of Progress," sponsored by the Associated Grocery Manufacturers of America. State, county, and community advertising increased sharply to promote tourist, vacation, and World's Fair trade. British co-operative advertising was extensively developed, especially in several of the dominions, where campaigns were instituted for agricultural products, salmon, fruit, butter, and cheese.

Consumers.—In the United States, the consumer movement developed to such proportions, in 1939, that no manufacturer could afford to ignore its influence. Consumer pressure caused greatly increased consumer activities among Government agencies. Advertisers tended, more and more, to tell their side of the "consumer movement" story.

Regulation and Ethics.—In the United States, the National Association of Better Business Bureaus issued a Fair Trade Code containing 10 injunctions, in addition to publishing the first edition of "A Guide to Better Advertising," a loose-leaf form designed for continuous service. The National Association of Independent Tire Dealers asked the National Bureau of Standards, U.S. Department of Commerce, to establish protective standards against misleading advertising. Liquor advertising was carefully scrutinized by the Temporary National Economics Committee (T.N.E.C.). Advertisers were requested to submit figures for expenditures in various media, while the Federal Alcohol Administration requested similar information from State control agencies. The Federal Communications Commission ruled that any radio program is an advertising program when it is announced that such program is sponsored, even though no actual advertising be included in the program. Numerous groups and associations, including the American Medical Association, New York Stock Exchange, New York City Better Business Bureau, and Associated Business Papers, Inc., adopted or sponsored new codes of advertising ethics and regulation.

Contests and Premiums.—In the United States, these two advertising adjuncts became more popular than ever during 1939. On one major radio network, about 65% of the commercially-sponsored programs featured contests or premiums. It was estimated that premiums and contest prizes, exclusive of cash awards and the advertisers' own merchandise, had a total value of \$425,000,000 for the year.

War and Advertising.—In the United States, advertising was directly affected by the European war. War-inspired copy took three definite trends: first, copy explaining new conditions due to the war; second, copy that merely used war interest as a background for the main message; third, copy that promoted domestic products as readily available substitutes for imported goods. "See America First" took on new significance as the theme of transportation and resort advertising.

The great bulk of steamship advertising was withdrawn and a marked increase in American advertising to Latin American dealers was noted. In the United Kingdom, the war has brought a new copy appeal based on such themes as "nerves," "war nerves," "gas-proof," etc. The British Food Ministry appointed an agency to handle its advertising, while the Council of the Pharmaceutical Society of Great Britain presented a set of advertising regulations to companies subject to the Pharmacy Act. British business revived its interest in co-operative advertising. Newspapers were

For Factory use and personnel in large numbers

STEEL FOR SECURITY

Small Steel for Home use

ADVERTISEMENT OF 1939 in A.R.P. News, London

BROADSIGHT A.R.P. GOGGLE



Has been specially designed for use when dealing with Incendiary Bombs or other brilliant combustion.

GOGGLES FOR AIR RAIDS, advertised in 1939 for British readers

sharply reduced in size as a conservation measure, and *War Illustrated*, which appeared during the World War (1914-18), was revived. The Government's campaign to increase voluntary enrolment of men and women for civilian national service in air-raid precaution work was eminently successful. Generally, cancellation of advertising programs was widespread, while all gasoline was unbranded and sold under the name "petrol," thus eliminating any need for advertising individual brands. The British Government made wide use of military posters and newspaper advertisements, and films played an important part in the Government's propaganda activities. (See also *PSYCHOLOGY, APPLIED: Market Research and Advertising*; *RADIO, SCIENTIFIC DEVELOPMENTS OF.*)

BIBLIOGRAPHY.—Among the year's books on advertising and related subjects were: A. E. Bull, *Advertising*; Herbert Dennett, *Direct Mail Advertising*; C. F. Propson, *Export Advertising Practise*; W. E. Trimble, *Introduction to Advertising*; K. M. Goode, *Manual of Modern Advertising*; R. Simmat, *Principles and Practise of Advertising*; W. D. Scott and D. T. Howard, *Psychology of Advertising*; Reginald Cox, *Routine of the Advertising Department*; G. B. Hotchkiss, *Advertising Copy*; R. Surrey, *Advertising Copy Technique*; F. L. Blanchard, *Essentials of Advertising*; Gilbert Russell, *Nuntius Advertising and its Future*; S. R. Hall, *Handbook of Advertising*; H. F. King, *Practical Advertising*; John S. Carlile, *Production and Direction of Radio Programs*; Studio Publications, Inc., *Poster Progress*. (D. St.)

Aeronautics: see AVIATION, CIVIL.

Afghanistan. Area 250,000 sq.mi.; pop. (est. 1937) 10,000,000; chief towns: Kabul (80,000), Kandahar (60,000), Herat (50,000), Mazar-i-Sharif (30,000). Ruler: Muhammad Zahir Shah; languages: Persian, Pushtu, and some Turki in the north; religion: Mohammedan.

History.—A year of otherwise peaceful progress was broken by echoes of the trouble in Europe. The Government declared its neutrality, but was reported to have ordered a general mobilization and to be exercising special vigilance on the Russian frontier. On the eastern border, hostilities were opened, within a week after the German invasion of Poland, by a tribal gathering from Tirah; but this was repelled by joint action on the part of the Afghan and British authorities. In its attitude generally, Afghanistan was keeping touch with the other signatories of the Saadabad Pact of Friendship, viz., Turkey, Iraq, and Iran. (ME.)

Finance.—Revenue and expenditure about Rs. (Afghan) 150,000,000; currency: Rs. 3.95 (Afghan)=Rs. 1 (Indian). Rs. 1 (Afghan)=5d.

Trade and Communication.—(1938) Imports, Rs. (Indian) 23,532,212; exports, Rs. (Indian) 29,644,821. Persian lambskin is one of the most important exports. Other exports are carpets, fruit, wool, and cotton. Roads: trade routes, Kabul to Peshawar (India) 210mi., and Kandahar to Chaman, 70mi.; there are about 2,265mi. of unmetalled roads connecting the chief towns.

Agriculture.—Wheat, rice, millet, maize, sheep, Persian lambskin; wool (1936) 6,800 metric tons.

A. F. of L.: see AMERICAN FEDERATION OF LABOR.

Africa, British East: see BRITISH EAST AFRICA.

Africa, British South: see BRITISH SOUTH AFRICA.

Africa, British West: see BRITISH WEST AFRICA.

Africa, French Equatorial: see FRENCH COLONIAL EMPIRE.

Africa, French West: see FRENCH COLONIAL EMPIRE.

Africa, Italian East: see ITALIAN COLONIAL EMPIRE.

Africa, Portuguese East and West: see PORTUGUESE COLONIAL EMPIRE.

Africa, South-West: see SOUTH AFRICA, THE UNION OF.

Africa, Spanish West: see SPANISH COLONIAL EMPIRE.

Africa, Union of South: see SOUTH AFRICA, THE UNION OF.

Agricultural Adjustment Administration (AAA): see DRY FARMING; UNITED STATES: *The Farm Problem*.

Agricultural Chemistry and Engineering: U.S. Bureau of: see CHEMISTRY AND ENGINEERING, AGRICULTURAL, U.S. BUREAU OF.

Agricultural Machinery: see FARM MACHINERY.

Agriculture. The United States farmers have had three good crop years, 1937, 1938, and 1939, and the nation has gradually restocked the supplies depleted by the severe droughts of 1934 and 1936. Prices, however, have not reacted favourably.

In the United States, the first two-thirds of the year 1939 was one of low and falling prices for farm products accompanied by high taxes and wages, and high prices for most goods and services purchased by farmers.

The low prices of farm products were due to (a) the combination of forces which caused gold to have a very high value, depressing all commodities, including farm products, and to (b) the abundance of nature which supplied good crops, tending to depress farm prices even more. In Aug. 1939, the index of United States farm prices was 88, when the five years 1910-14 was 100. Retail prices of food were much higher, 132; and the cost of living, 143. The purchasing power of farm prices in terms of the cost of living was 62% of normal, compared with a recent high of 89 in April 1937 and a low of 42 in Feb. 1933.

The low purchasing power of farm products in recent years has resulted in the inauguration of many remedial measures to assist agriculture. They included acreage control, crop insurance, Government purchases of surplus crops, two price systems, tariffs, export bounties, trade agreements, direct cash payments, and the like. But these measures did not stem slowly falling prices.

With the outbreak of the European war, the direction of the movement of commodity prices was reversed. From August to September, prices rose from 15 to 25%. During October and November, there was some reaction to the rapid advance, but commodities generally continued well above the pre-war level.

Wars and Prices.—Most persons believe that wars induce advances in commodity prices. In reality, wars have been accompanied by all sorts of changes in commodity prices. During some wars, prices within the warring nations fell; during others, they rose; while during still others, they were unaffected. The problem is further complicated by the fact that some wars are accompanied by little or no change in prices in non-combatant countries;

whereas other wars are accompanied by price advances in neutral as well as combatant nations. The fact that during many wars some countries experience wild inflation adds to the confusion.

The experiences of the United States are a good illustration of the varied effects of war on prices. The Mexican War, 1846-47, and the Spanish American War, 1898, had little effect on prices in the United States (fig. 1). Prices rose 5% during the Mexican War, and fell 1% during the Spanish American War. On the other hand, the Revolutionary War, 1775-83, the War of 1812, 1812-15, the Civil War, 1861-65, and the World War, 1914-18, were accompanied by striking advances in commodity prices in the United States.

The advance in commodity prices during the Revolutionary War was due to the printing of paper money. The expression, "not worth a Continental," dates back to the excessive issue of the Continental notes of this period. This war did not disturb the price levels of non-combatants.

The 54% advance in prices during the War of 1812 was due to two forces: (1) a moderate depreciation of the paper money of this country, and (2) a world-wide rise in prices that accompanied the Napoleonic wars then in progress. Most of the rise in prices in the United States was due to the latter force which affected commodity prices in all countries.

The 131% advance in commodity prices in the United States during the Civil War was primarily due to the depreciation of the greenbacks in terms of gold. This war had little or no effect on prices of non-combatant countries, whose price levels advanced, on the average, only 7%.

The sharp advance in commodity prices in the United States during the World War (1914-18) was due to a world-wide rise in prices which affected all neutral gold-standard countries as well as the warring nations. Since the dollar did not depreciate in terms of gold, the advance in commodity prices was due to the world-wide forces that caused gold to lose value. This was the only major war involving the United States in which the currency did not depreciate.

Apparently, prices in a country can rise because of the forces

that cause the standards of value, gold or silver, to decline; or that cause the paper money of a country to decline relative to its standard. The Napoleonic wars and the World War (1914-18) are the only modern conflicts of sufficient magnitude to cause a world-wide depreciation of the metallic standards. The minor wars of the United States, England, France, and Germany were not of sufficient magnitude to cause world-wide advances in the prices of commodities. The many advances due to currency depreciation occurred during both major and minor conflicts, but usually affected only the country in question.

A prolonged European war would probably be accompanied by a rise in commodity prices due to forces that (a) cause a depreciation of the measure of value (gold) and (b) cause the depreciation of the paper currencies of some of the combatants. Since the United States has such huge stocks of gold, most of the changes in prices in this country will be due to forces causing a world-wide rise in commodity prices in terms of gold, rather than to a depreciation of the paper dollar. If the United States becomes involved in a prolonged conflict, conditions may eventually arise which would cause the dollar to depreciate.

Prices of Individual Commodities.—If a prolonged major war ensues, the United States price level will probably advance considerably above its present level. The time, the cause of the advance, and how far it will go are largely subjects for speculation. In general, prices of raw materials will rise more rapidly than retail prices, costs of living, wages, and salaries. Prices of specific war materials and certain types of agricultural products will advance more rapidly than the average of raw materials. Concentrated food products, like wheat, pork, and corn are likely to advance more rapidly than bulky, perishable products, like milk, potatoes, fruits, and vegetables.

Since there is so much uncertainty concerning the effect of wars on prices of individual commodities, the best method of procedure is to analyze their price movements during the World War (1914-18). Prices of beans advanced more rapidly and a greater amount than the average of all farm products. This may have been due to the fact that the United States is normally a net importer of beans.

The Ohio farm price of wool advanced more rapidly than the general level, and during 1917, 1918, and 1919, was very high compared with other products. Wool is a commodity in great demand in times of war, and normally the United States is an importer of this product.

In the year 1939 wool was the highest-priced farm product. The index of the October farm price of wool was 168, compared with 97 for all farm products. The recent rise in the price of wool was more rapid than that which occurred during the early months of the World War.

During the early years of the World War (1914-18), cotton advanced somewhat less rapidly than other farm products. This was due to the huge crop of 1914. Like the World War, the European war begins with large stocks of cotton in the United States. During the later years of the World War, cotton was high relative to other farm products because of less than average yields.

The farm price of wheat in Kansas advanced more rapidly than the general level of farm products. The fortunes of wheat farmers are dependent upon the acres planted, acres harvested, and yield per acre, as well as the price of wheat. During the early years of the World War, there was an unusually favourable combination of these factors that resulted in large production. The acreage planted expanded about 10%, and in 1915, 97% of that acreage was harvested. Consequently, with better-than-average yields, the nation produced a billion bushel crop, the largest on record. This country faces another great war with somewhat more than normal stocks of wheat, but a reduced acreage, and a con-



A NEW LIGHTWEIGHT TRACTOR with detachable plowing implements controlled by hydraulic power was introduced June 29, 1939, by Henry Ford

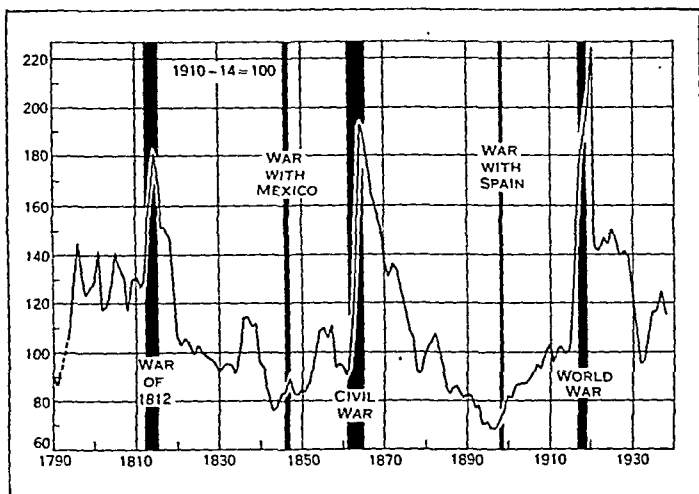


Fig. 1.—EFFECT OF WARS on wholesale prices of all commodities in currency in the United States, 1790–1938

dition reported to be the poorest in history.

The farm prices of corn and hogs advanced approximately with the average of all farm products.

The farm price of eggs in New York advanced less rapidly than the general level of all farm products. Previous to the outbreak of the World War (1914–18), there had been a very rapid expansion in the poultry business in the United States, and some liquidation would have occurred in any event. For this reason, egg prices lagged behind the advance in the prices of feeds and many other commodities.

Prior to the European war, there was a long period of liquidation in the number of chickens on farms. It seems reasonable to assume that with a prolonged war, egg prices will advance more rapidly relative to other things than was the case during the war of 1914 to 1918.

Apple prices lagged behind the general advance. The volume of exports of fresh and dried apples did not experience the sharp advance that took place in many other farm products. During the war in Europe, apple producers may lose a considerable part of their foreign market because of the orders issued concurrently by Great Britain and France prohibiting the import of apples, effective Nov. 20, 1939.

The farm price of hay lagged in the general advance.

Land Values.—During the World War, land values responded to the rise in commodity prices in all parts of the United States, but the amount of rise was unequal in different parts of the country. There are at least three reasons for these differences: (a) distance from the final market, (b) type of commodity produced, and (c) amount of cash costs.

Any force that causes commodity prices to rise results in an unequal reaction in the various components of the price structure.

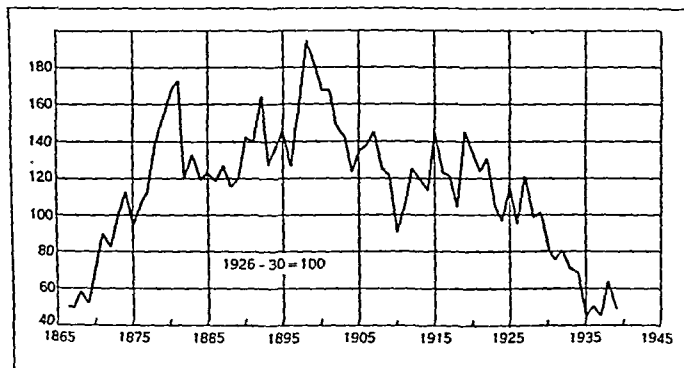
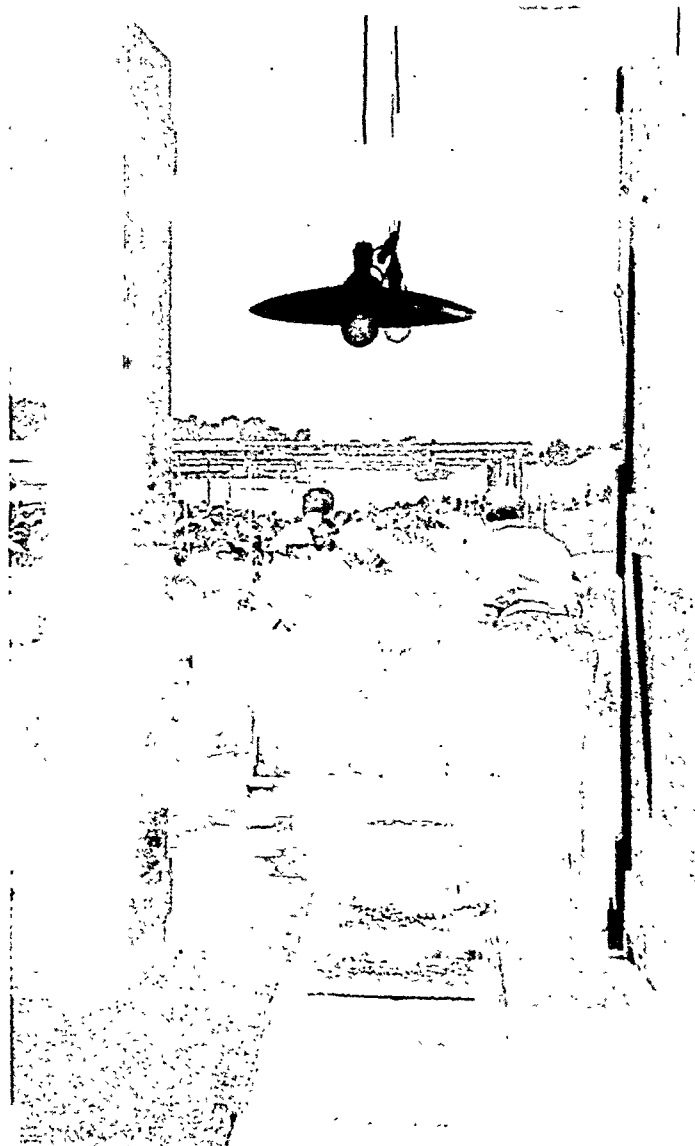


Fig. 2.—INDEX NUMBERS of the physical volume of the agricultural exports per capita from the United States, 1866–1939



EXPERIMENTAL PLANTS are rolled out of a "darkhouse" for testing in the sunlight in 1939 at the U.S. Dept. of Agriculture's extensive research farm in Beltsville, Maryland

Basic commodities rise more rapidly than freight rates and marketing costs. This in turn causes prices of commodities far from market to rise more rapidly and a greater amount than the prices of the same products near markets. For instance, hay rose more in Nebraska than in New York. The index numbers of prices paid for farm products in North Dakota rose more rapidly and a greater amount than in New York. Farm prices in Oklahoma rose more than in New Jersey. A part of these differences may have been due to the types of commodities included, but a part was due to distance from market.

Somewhat higher prices were paid for the non-perishable and concentrated products of the Middle West, which were in somewhat greater demand, than for the bulkier and more perishable foods produced along the seaboard.

The Atlantic seaboard farmers have greater relative cash outlays for fertilizers, feed, and the like, which respond quickly to rising prices, than the grain and livestock producers of the Middle West. These factors resulted in a greater advance in land values in the Middle West. Because of the greater distance from the final market, a higher percentage of non-perishable and concentrated prod-

ucts, and smaller cash expenses, land values in Iowa advanced more rapidly than in New York.

Exports of Agricultural Products.—From 1865 to about 1900, the physical volume of the per capita agricultural exports from the United States trebled (fig. 2). With the turn of the century, exports started to decline, and this decline was interrupted only by the World War. Most of the decline during the past 40 years has been due to the failure of agricultural production to increase with our expanding population.

Despite the excessive demand for agricultural products during the World War, the per capita exports from the United States exceeded those of the immediate pre-war years in only one year, 1915, when the United States produced the largest per capita amount of food and feed crops in her history.

From 1910 to 1914, the American farmer raised 2.14ac. of the six starch crops, corn, wheat, oats, rye, barley, and buckwheat, the backbone of the U.S. food supply. During the succeeding war period, there was much agitation to increase the supply of grains. In spite of these efforts, the per capita acreage did not increase, averaging 2.14ac. in 1914-18, and there was relatively little shift in the production of crops in the older areas of the United States. The most striking change was in the acreage of wheat, which increased in Oklahoma, Texas, Montana, Idaho, and Colorado.

Since 1920, there has been a steady decline to about 1.6ac. in the per capita acreage of these crops. This decline was due to the increase in U.S. population with relatively little change in the total acreage of these crops.

From 1910 to the late '20s, there was relatively little change in the production per acre, the average being about 1,217 pounds. With the deflation of the '30s and the two severe droughts of 1934 and 1936, there was a drastic decline in the production per acre. With a declining acreage per capita and a stable to declining yield, the per capita production of these grains declined rapidly. During the World War, the nation produced about 2,600lb. of grain per capita, and since 1920, about 2,000 pounds. During the World War, the exports* represented about 15% of production; in the late '20s, about 10%; and during the last three good crop years, about 5%.

In recent years, the low commodity prices and dwindling exports have led to much discussion of the loss of the foreign market for U.S. agricultural products. As a matter of fact, in recent years, this nation has had relatively little to export but cotton, except in good crop years or when the supply of hogs was large.

Any attempt to purchase substantial quantities of food from the

*Exports of grain and grain products plus pork and pork products.



"THAT CUSTOMER'S BACK AGAIN." Ray of *The Kansas City Star* pictures the ever-present agricultural problem of raising prices and reducing surplus

United States during the present conflict would result in considerable advance in the prices because supplies are so scanty.

If the population of the United States continues to increase, there will be little food to export even in the good crop years, and in poor crop years it will be necessary to supplement U.S. production with imports. (See also ALFALFA; CHEMURGY; CORN; DROUGHT; DRY FARMING; DUST STORMS; FARM INCOME; FARM MACHINERY; FARM MORTGAGES; FERTILIZERS; HAY; HORSES; IRRIGATION; LEGISLATION, FEDERAL; LAW (CASE): Agriculture; OATS; PRICES; WHEAT, etc.) (F. A. PE.)

Agricultural Planning.—One of the most significant efforts in the field of agricultural planning in the U.S. was launched during 1939. Definite progress was made during this first year of the co-operative land-use planning program started under the joint leadership of the Department of Agriculture and the State land-grant colleges.

Because of the rapid expansion, during recent years, of Federal and State efforts to deal directly with such problems as soil erosion, instability of farm prices, farm tenancy, and many others, and because of the fact that many of the programs directed toward solution of these problems were started during a national economic crisis, many instances have occurred in which two or more of the programs do not fit together as effectively as they might when they meet one another on the land.

The present agricultural land-use planning program is a co-operative effort on the part of farm people, agricultural technicians, and administrative officials of agricultural programs to work out immediate and long-term goals for each State, county, and community that will guide public programs and serve as a basis for obtaining better co-ordination between them. Emphasis has been given to the land-use aspects of agricultural planning because it is believed that this is a good place to begin. Land use is important because of its close relationship to the welfare of farm people.

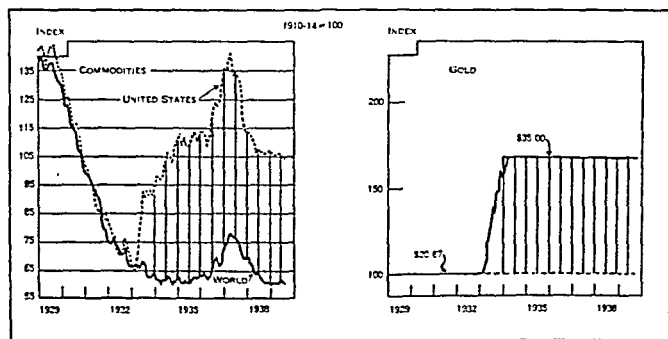


FIG. 3.—INDEX NUMBERS OF PRICES OF 40 BASIC COMMODITIES IN THE WORLD IN GOLD AND IN THE UNITED STATES IN CURRENCY AND OF THE PRICE OF GOLD IN THE UNITED STATES, 1929-1939. From 1929-1933, commodity prices in the United States followed the downward course of the world price level (left). In the spring of 1933, the United States left the gold standard and the price of gold was raised from \$20.67 to \$35 per ounce (right). Commodity prices in the United States rose relative to the world (left). The area between the world price level and the United States price level (left) is about equal to the area between the old and the new price of gold (right)

In nearly two-thirds of the agricultural counties in the United States, county planning committees have been organized to conduct land-use planning work. The membership of each committee includes from 10 to 20 farm men and women together with representatives of Federal, State, and local agencies responsible for agricultural programs. In many of the counties, community committees have been established to assist in the work. Also, there is a State committee, similarly composed, for each State.

These committees are studying the facts regarding the physical and economic characteristics of each area and, on the basis of their interpretations, are making recommendations for improving the application of public programs to local conditions. In 800 counties, the committees were doing intensive planning work during 1939. They delineated the various land-use problem areas in each county, assembled information regarding the characteristics and problems of each area, and made recommendations for desirable adjustments. Several of the county committees prepared reports that are now used by the various agencies in the formulation of administrative policies.

Considerable attention has been given to the problem of finding the most effective methods of converting the recommendations of land-use planning committees into action. As an approach to this problem, at least one county in each State is attempting to develop a unified plan of action for administration in 1940. The planning committees in these counties have selected a few of the problems that need to be dealt with in achieving the objectives which have been agreed upon, and have translated their recommendations with reference to these problems into specific proposals for action. In a number of cases public agencies have agreed to make substantial modifications in the local application of their programs as a part of a co-ordinated attack on specific problems. Some of the proposals have already been acted upon.

The procedure which has been adopted for doing the job of land-use planning is based on the philosophy that farm people should participate in the formulation of administrative, as well as legislative policies, and that their participation is required to do the most effective job. However, the results of this work do not represent farmer opinion alone; rather, they represent a combination of the practical wisdom of farm men and women, the technical judgment of experts, and the experience of administrators. The accomplishments that were made during the first year indicate that continued improvement in the application of farm programs is likely to result from the land-use planning work. (B. W. A.)

Air Conditioning. The year of 1939 witnessed continued advance in the technique of air conditioning. Also, there was a substantial gain in sales volume over the previous year, stimulated by improved business conditions and by an increased public recognition of the benefits of air conditioning.

General Business.—While the United States is still the world centre of broad air-conditioning acceptance, various parts of South America and the West Indies are continuing to make strides in this direction, largely with equipment imported from the United States. The awakening air-conditioning interest which had just begun in certain parts of Europe has undoubtedly been stifled by the war. Contemplated further activity in Southern Africa has probably been deferred for the same reason.

Air-Conditioning Technique.—There were no new and radical developments in the art of air conditioning during 1939, but a number of refinements in product design and application practice make the year notable in the history of air conditioning. In the field of large central plant conditioning a number of important installations were completed. An outstanding feature of these installations was the development of improved individual control for each air-conditioned room. The day has passed when a single

control station will regulate in acceptable manner the conditions in an entire building or even all the rooms on one floor of a large hotel or office building. In medical circles it has been recognized for some years that individual requirements vary due to age, sex, state of health, and other factors. Now the designer of central plant air-conditioning systems is prepared to make individual room control available in practical form, either with room units operating from a central supply or with zone control from a central conditioner. Another notable refinement is the improved appearance and balancing facilities now available in newly developed air delivery and exhaust fixtures for rooms. One outstanding installation employs a combination air delivery and electric light fixture mounted in the ceiling at the centre of the room. The air is delivered through an annular orifice so designed into the fixture that it is not recognized as an air delivery opening but rather appears to be part of a modernistic styling. Behind the orifice are a series of adjusting dampers which provide for an extremely even delivery of a sheet of air high overhead, from which position it is drawn slowly to the floor without draught. The exhaust openings are somewhat similarly built into the metal baseboard in such a way that they cover the entire exposed perimeter of the room and are very pleasing to the eye. The even and draughtless air distribution in these rooms is probably as perfect as any yet produced in commercial application.

Small air-cooled portable room units for summer air conditioning have been substantially improved in reliability and performance. They are now available in a larger variety of sizes and at lower prices than heretofore. Sales of this type of unit in 1939 increased several times in volume over 1938 sales and their popularity indicates a further increase in sales volume during 1940. Ultimately this unit will represent a very large volume item to successful manufacturers. For large rooms, small suites of offices, and other similar applications, the self-contained water-cooled summer conditioner has also made great strides. It is compact, easily installed and relatively low in cost. Such units are rapidly displacing the central type of system, in applications up to about ten tons of cooling capacity. (A ton of cooling capacity is the equivalent in cooling effect to that obtained from the melting of a ton of ice in 24 hours.) A ten-ton unit will handle a typical small store or shop, a restaurant seating perhaps 150 people or a suite of six to ten average sized offices. A simple duct system would be required for the latter. A successful large store installation was made in 1939 mounting six ten-ton units around the sides of the store on the first floor, installed with a minimum of ducts for air delivery.

Both the small air-cooled and the larger water-cooled units provide for cooling, dehumidifying, circulating, and air cleaning, as well as ventilation in many instances. They may be used for circulation, air cleaning, and ventilation in the winter time, and winter heating and humidifying can be added to the large units, if year-round air conditioning is desired.

Winter air conditioning continues to grow in popularity and acceptance, particularly for homes, where the benefits of circulated, heated, humidified, and filtered air are especially appreciated.

Physiological Benefits.—The full benefits of air conditioning to health still remain to be completely identified and investigation work along this line continues in various schools and medical centres. However, it is now generally recognized that proper air conditioning provides definite benefits to most sufferers from hay fever and pollen asthma, as well as to certain post-operative hospital cases. There is definite indication, yet not fully proved, that it tends to prevent transmission of the common cold. (See also FLOUR AND FLOUR MILLING; PUBLIC HEALTH ENGINEERING.)

(EL. HA.)

Aircraft Carriers: *see* AIR FORCES: *Navy*; NAVIES OF THE WORLD.

Air Forces. *Army.*—The year 1939 was especially significant to the United States Army Air Corps. In 1909, the Wright brothers had delivered to the United States Army the world's first military aeroplane. On the thirtieth anniversary of that event was inaugurated the greatest peace time expansion of the Air Corps in U.S. history. Congress authorized and appropriated \$302,000,000 for the purpose, \$50,000,000 of which was made available before June 30, to initiate a systematic two-year augmentation program.

The requirements of this expansion include the training of pilots and mechanics, the procurement of aircraft and equipment, and the construction of new bases. Eighteen thousand enlisted men are to be trained as specialists in the technical subjects relative to the operation of aircraft and accessories. Of these, 1,000 men will be trained at civilian mechanic schools, and the remainder at the three branches of the Air Corps Technical school: Chanute Field, Rantoul, Illinois; Scott Field, Belleville, Illinois; and Lowry Field, Denver, Colorado. There are 4,356 flying cadets to be trained as pilots, all of whom are to enter training prior to Oct. 1, 1940. The last of these classes will be graduated in June 1941. Another requirement of the expansion program includes the provision of a total of 5,500 aeroplanes by July 1, 1941. This program required careful planning to the end that all of the components—materiel, personnel, and training—be balanced, so that no part would be weakened by inadequacies or over-stressing of any other part. The chief of the Air Corps made his plans in recognition of the fact that the military air forces can be utilized successfully only when all factors which contribute to air power are utilized as a whole: personnel, materiel, bases, research, procurement, supply, installations, training, and operations.

In addition to this great task of expansion, some of the outstanding accomplishments of the Air Corps during 1939 were:

- (1) The breaking of six international flying records, including the carrying of heavy loads to altitude at high speed, and flying long distances with heavy loads at high speed.
- (2) The formation of a production engineering section of the Materiel Division to meet the expansion program.
- (3) The expansion of the experimental engineering section of the Materiel Division throughout its five main laboratories.
- (4) The transfer of the chief of the Materiel Division and his staff to the office of the chief of the Air Corps, in Washington.
- (5) The preparation over a nine-months' period of contracts for procurement and construction amounting to more than \$197,300,000.
- (6) The furtherance of technical studies on the subject of vibration and flutter in aeroplanes; the continuance of tests on automatic flight and landing; the development of auxiliary power plants for aeroplanes; the application of stainless steel to the complete aeroplane structure; and the development of a large four-bladed propeller.
- (7) Important improvements in military photography. Tests were made to develop large-scale prints suitable for lithographic reproduction, thereby making practicable their use as substitutes for maps. To aid in the detection of camouflage, colour photographic equipment was studied. Night photography was advanced by experimentation. Progress was made in high-altitude and long-distance large scale photography, using infra-red film and a 60-inch telephoto lens mounted on a K-10 camera body.

As a result of this program the GHQ Air Force will have been expanded by June of 1941 to eight bombardment groups, six reconnaissance squadrons and five pursuit groups. Plans have been made for the increase in the number of air bases from the present number of six to eleven. (*See also* ARMIES OF THE WORLD.)

(H. H. A.)

Navy.—The Bureau of Aeronautics has continued, during the year 1939, to develop, procure, and maintain aircraft in accordance with Fleet needs. The aircraft program resulting from the requirements of the Treaty Navy has been completed and a definite, orderly plan established to provide aeroplanes and to train aviation personnel for the increased Navy authorized by the Naval Expansion Act. Existing shore facilities to support the operating aircraft are being developed in direct proportion to the funds

available. The need for additional facilities on the East coast, in the Alaskan area, and in the mid-Pacific islands was recognized by the Hepburn Board, appointed during the year, and as a result of its recommendations the 76th Congress, first session, authorized the expenditure of funds for construction, which, when realized, will provide aviation facilities in outlying strategic areas as well as on both continental coasts, and for the expansion of certain of the already established stations.

The aircraft carriers U.S.S. "Yorktown" and U.S.S. "Enterprise" joined the Fleet early in the calendar year and a contract was awarded for an additional ship of this type, to be known as the U.S.S. "Hornet."

Two hundred and seventy-two aeroplanes were ordered to replace those worn out in service or lost due to crashes, and to expand the Naval aeronautical organization in accordance with the Naval Expansion Act. This number includes several new types, embodying considerably advanced performance, which are being supplied to Fleet squadrons as rapidly as contract deliveries permit. At the end of the fiscal year, June 30, 1939, the United States Navy had on hand approximately 2,250 aeroplanes.

All combatant ships of the Navy, with the exception of the destroyers and submarines, carry their own complement of aeroplanes, varying in number from two to three on the battleships to 75 on the aircraft carriers, the types used being determined by the missions of the surface ship to which they are attached. The requirements for carrying out these missions have brought into being aeroplanes possessing mechanical features and capabilities that differ greatly from aeroplanes operated by land-based military forces and by commercial aviation establishments. Continuous efforts are being made to keep to a minimum the number of types, by designing each to perform the maximum number of functions.

The following is a brief description of these basic types:

(a) The fighting plane represents the maximum in performance, manoeuvrability, and gunnery, is small and high-powered, with the primary mission of attacking enemy aircraft with gunfire.

(b) The torpedo and bombing planes, the largest type employed in the carriers, are designed to attack enemy heavy vessels or shore bases. An important type under this classification is the dive-bomber, which, as its name suggests, delivers its attack in a vertical or near-vertical dive on its objective, either ashore or afloat.

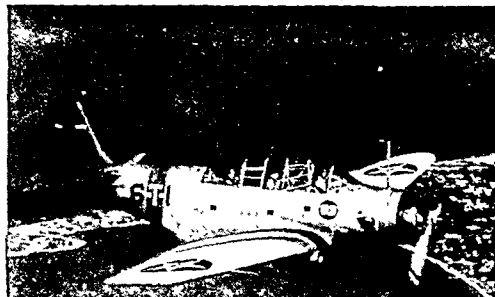
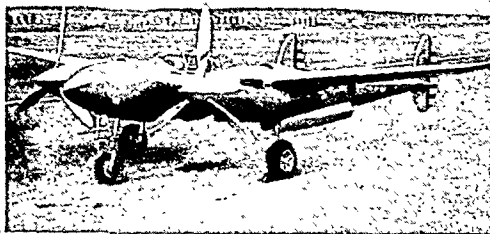
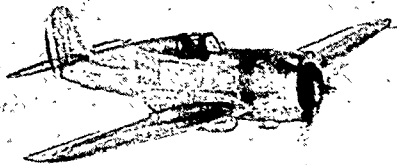
(c) The scouting and observation planes require speed, range, good gunnery defence, and excellent facilities for radio, in order to accomplish their missions of scouting for the cruisers and carriers and observing for the battleships.

(d) The patrol plane is the largest type in service in the Navy, its size being necessitated by the fact that the craft must be capable of great range, be seaworthy, and sufficiently habitable to permit operating for protracted periods independent of its base. In addition, the patrol plane must be self-protecting while carrying out long-range strategic scouting flights, and must be capable of joining the Fleet at any time.

Aerodynamic and engine research, coupled with development of more effective and powerful armament, continuously result in advancing types of naval aircraft. (J. H. Ts.)

The World.—Contrary to expectation, the year 1939 came to an end without providing definite answers to many questions that have been debated by air strategists and tacticians for a decade. When war broke out in September between major European powers it was freely predicted that the first few weeks would provide the data necessary for the final evaluation of the real worth of the air arm in modern warfare. In preparation for any eventuality, air defences of all sorts were fully manned, cities were sand-bagged and partially evacuated, and nightly black-outs have become an accepted phenomenon. But after four months of war no one is yet certain of the role that aviation is to play in the conflict. So far, whatever strategic gains have been made, have been brought about by the threat rather than the application of air power. (*See also* CHEMICAL WARFARE; TACTICS IN THE EUROPEAN WAR.)

The modern military aeroplane is a far more effective weapon than its prototype of 1918. Where the best single seater fighters of that period had top speeds of 100-120 m.p.h., corresponding types



Upper left: CLOSE-UP OF CURTISS HAWK 75A pursuit plane taken just before it dived at more than 575 m.p.h. Jan. 23, 1939—the greatest speed man has yet attained

Upper centre: U.S. LOCKHEED XP-38, with twin motors and tricycle landing gear

Upper right: PROTOTYPE OF THE U.S. CURTISS P-40 advanced pursuit plane, reputedly the fastest in the world

Above: TORPEDO BOMBER from U.S.S. "Enterprise"

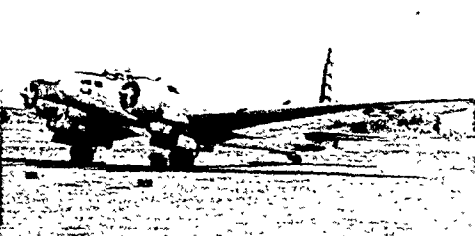
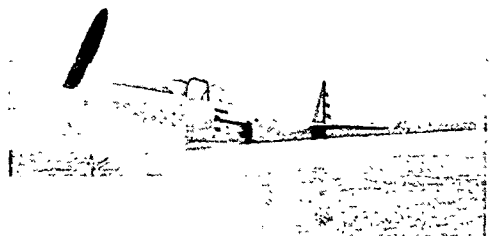
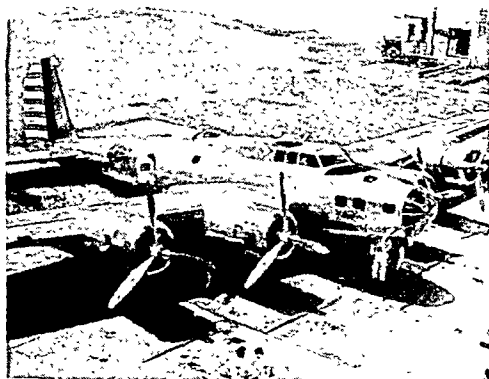
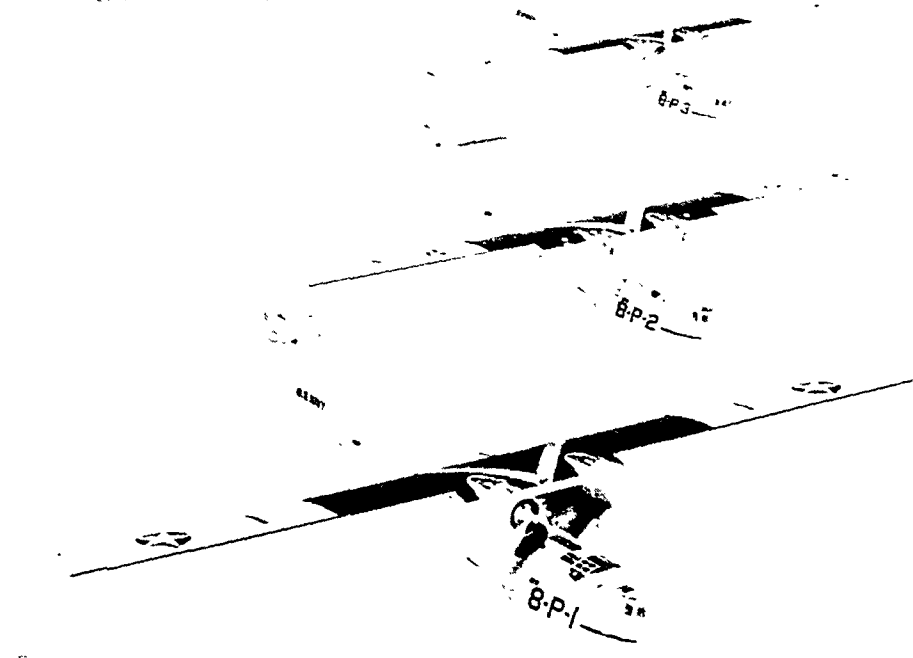
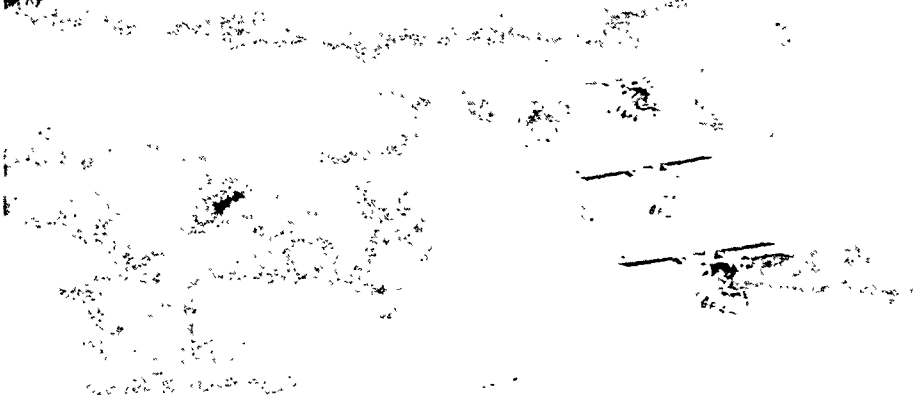
Right: PATROL BOMBERS of the U.S. Navy at Pearl Harbour, Hawaii, in 1939

Below: FIRST OF A FLEET of Boeing B-17B "flying fortresses," delivered to the U.S. Army Air Corps July 29, 1939

Lower left: BELL XP-39, a late American pursuit plane

Lower centre: DOUGLAS B-23, an American heavy bomber

Lower right: MARTIN MODEL 162 FLYING BOAT, delivered in 1939



today (January 1, 1940) are operating in the 350-400 m.p.h. range, and higher speeds are expected in the immediate future. Where the bombers of 20 years ago carried a relatively few pounds of military load at 80 m.p.h. for a few hundred miles, today's so-called medium class machines easily handle a ton or more of bombs over 1,000-1,500 mi. ranges at speeds upwards of 250 miles per hour. Much larger bombers are in being and in prospect, capable of carrying several tons of explosives over several thousands of miles at 250 m.p.h. or better. The four-engined Boeing "Flying Fortresses" of the U.S. Army Air Corps, the Junkers 90s of the German Luftwaffe, and the new Fairey and Handley-Page bombers of the Royal Air Force, are typical of the best machines in this category.

These trends have given rise to questions (as yet unanswered) as to how such aircraft are to be used most economically and most effectively. What, for example, is the real mission of the modern bomber? Will its use be limited to purely military objectives, or, as the disciples of General Douhet claim, can it be used most effectively in great armadas in overwhelming attack against industrial centres and against civil populations in order to force a quick change in a national viewpoint by destroying morale and the will to resist? Can massed bombers be used effectively against naval vessels at sea? Then, what is the proper function of fighter aircraft? Is its only mission to protect the great bomber fleets, or is it to be used primarily to achieve domination of the air space over land and sea operations to prevent enemy observation of troop or of ship movements? What of the tactic of dropping bodies of troops by parachute behind enemy lines? How good are modern aircraft detectors, or anti-aircraft guns, or balloon barrages for defence against air attack? How effective are bomb shelters? How good is modern camouflage? Will air power or sea power dominate the world trade routes of the future? These are but some of the questions still to be answered, questions whose final solution may effect profound changes in national policies and which may easily affect the course of history.

Military operations of the last few years in China, in Ethiopia, and in Spain failed to shed much light on the problem. In China and North Africa campaigns were conducted by nations with powerful air forces against opponents with little or no retaliatory air strength. Spain, as far as the major European powers were concerned, was little more than a laboratory for the testing of certain new tools of war. No nation had enough interest in that conflict to warrant the disclosure of its latest methods or equipment. The scale of aerial operations was much the same as that of 1918.

The German campaign in Poland was different. It yielded some very definite clues, but did not provide final answers. There is little doubt, however, that the swift success of early September was due to the efficient use of massed air power against military objectives. Germany's first move was to put the Polish air force completely out of action by concentrated attack against the Polish aerodromes. By rendering the air bases untenable, the Polish air force, such as it was, was completely immobilized, and assistance by air from England and France became impossible because the flying fields from which their aeroplanes would have operated had been destroyed. The complete story is not yet available, but there can be no question but that the employment of aircraft in large numbers was the *sine qua non* of Hitler's blitzkrieg in Poland. (See also LIGHTNING WAR.)

But whatever aerial tactics and strategy evolve as the present conflict goes on, immediate interest lies in the relative air strength of the belligerents. For obvious reasons, few factual data have been released by the several powers, but a number of estimates have been made by qualified observers over a period of several years that provide a basis for estimation. Any evalua-

tion must take into account a great deal more than the alleged numbers of aircraft on hand. Even if reasonably accurate figures for the totals were available, the difficulty of making a proper distribution between "first line" and "reserve" aircraft still remains. Clearly, however, there is more to it than the possession of a large number of machines. The aircraft must be up-to-date as far as performance is concerned, and they must be types adaptable to the purposes at hand. They must have competent pilots to fly them, and they must be served by well trained maintenance forces in the field. Most important, the organized air force must be backed up by an aviation industry capable of producing large quantities of first-rate aeroplanes, engines, and accessories.

The basic elements of air power may be reduced to six general items, as follows:

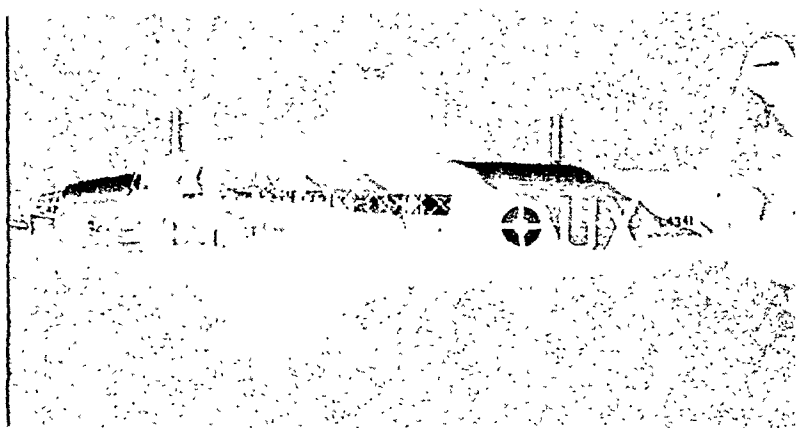
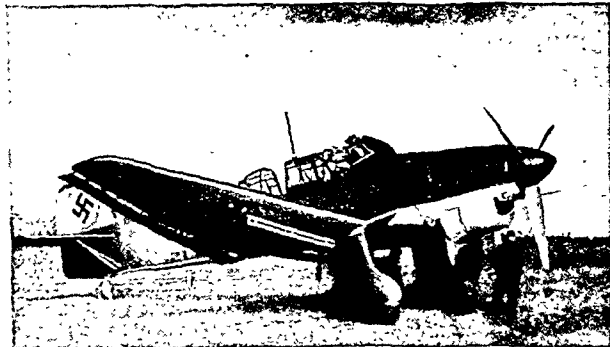
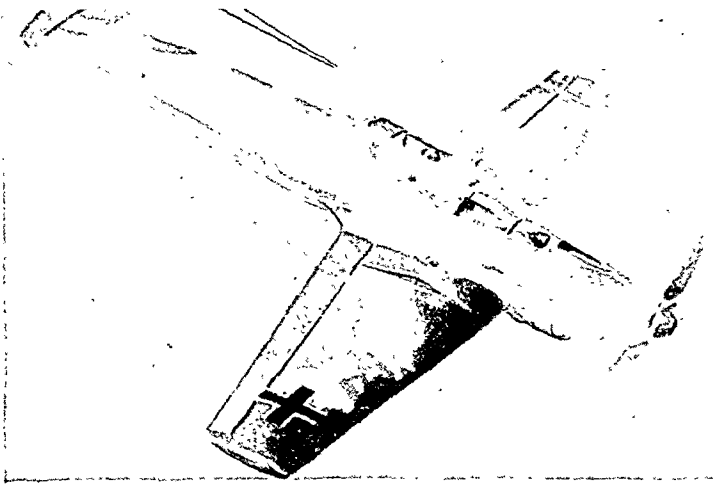
1. Number of aircraft (including "first line," reserves, and trainers).
2. Quality of aircraft (including performance, efficiency of design for construction and maintenance, materials used, etc.).
3. Production rate (during the immediate pre-war period).
4. Productive capacity (maximum probable in war-time).
5. Personnel available (pilot, ground crew, industrial).
6. Morale (industrial and national).

At the conclusion of this article will be found an estimate of the relative strength of the major European powers as of the end of 1939 based on a point scoring system to give a composite picture of the standing of the countries with respect to these six elements of air power. This method of comparison was first used in an article "Box Score" which appeared in *Aviation* magazine for Jan. 1939. A comparison with the present figures gives an indication of the changes that have taken place during 1939.

Apart from the difficulty of obtaining accurate figures on air strength under current circumstances, the second and the sixth elements in the above classification obviously do not lend themselves to exact statistical analysis. Quality of aircraft may be gauged not only by the performance records set, but by the general appearance of the machines and their components. It may also be measured by the amount and kind of aeronautical and allied research that is conducted by the several countries involved. In such a highly technical field, it may well be that wars will be won in the laboratories rather than on the actual field of battle.

As for morale, no attempt has been made here to compare the fighting ability of the pilots of the several nations collectively as tactical units, or as individuals. The safest assumption to make at this time (until experience proves otherwise) is to rank them all equally on that score. The rating of morale, therefore, is intended to reflect the industrial, rather than the military situation. In this case, it is limited to the aviation industries. It takes into account such things as the social and political situation, the general conditions of labour in the aircraft factories, the degree to which labour is controlled by the State, and the general economic condition of the country.

Germany.—Since 1933, Germany has attained front rank among the air forces of the world. The exact numbers of her military aircraft are not accurately known, but it seems probable that her total air fleets, excluding purely primary trainers, probably number over 12,000 machines, of which at least two-thirds are in organized squadrons of the Luftwaffe or in the active Luftwaffe reserve. The remaining fleet is made up of machines that were designed and built during the early reconstruction years, now obsolete for first line use, but which constitute a very real part of Germany's air strength for short range bombing operations in mass, and for training purposes. In quality, her first line machines must be ranked high in terms of their per-



Upper left: MODEL OF THE MESSERSCHMITT 109, Germany's best-known fighting plane, with top speed in excess of 350 m.p.h.

Upper right: AMIOT 370, French bomber with top speed of 310 m.p.h.

Above: THE JU-87, Germany's famous Junkers bomber

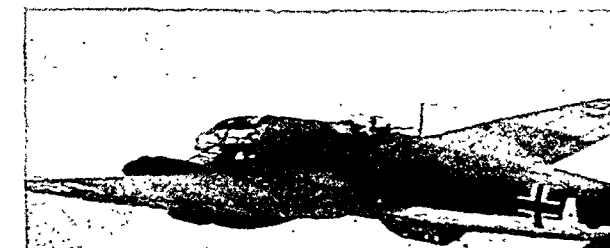
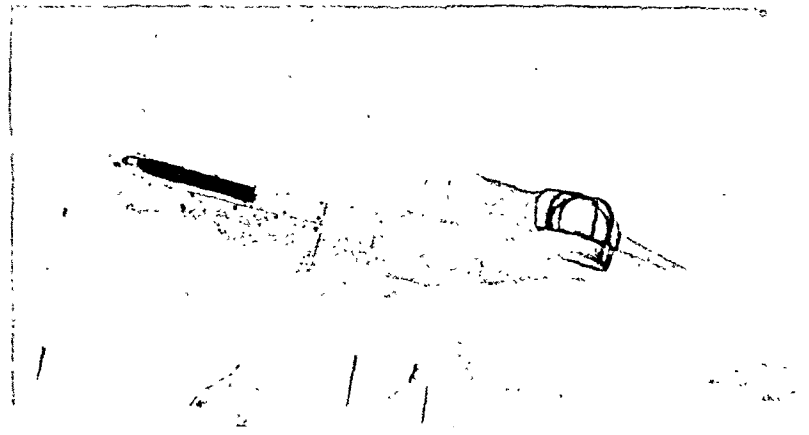
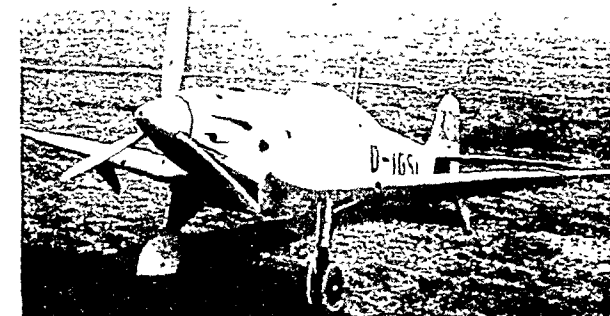
Right, above: LARGEST BRITISH BOMBER, the Vickers Wellington, with speed of 180 m.p.h. fully loaded

Right, below: VICKERS SPITFIRE, Britain's fastest fighting plane, capable of 362 m.p.h.

Below: GERMAN HEINKEL PURSUIT PLANE—the HE-112

Lower left: GERMAN HEINKEL 111 BOMBER on raid near Cracow in Sept. 1939; first photograph of this plane permitted by Germans to leave country

Lower right: BOULTON PAUL DEFIANT, a new speedy British fighter



formance and their ability to meet the requirements of active duty as defined by the German general staff. Extensive research laboratories, manned by a large and well trained personnel, provide the designers of the Reich with aerodynamic and structural information of the highest order. The average German machine may not have the finished appearance that characterizes U.S. military aircraft, but it has been designed for rapid production, the materials have been used efficiently. Its performance is up to modern standards, although average life expectancy may seem short as compared with normal commercial aircraft, but it is undoubtedly long enough to cover the probable period of usefulness as a military weapon. Production rates of such machines have been very high during the past two years. During 1938 and early 1939 the average was probably close to 500-600 units per month with at least one month known to be over the 1,000 mark. Since the outbreak of the European war the probabilities are that the average output has been better than 1,000 units per month, which represents a high percentage of actual productive capacity. Few figures are available as to the number of active pilots in Germany, but it is known that thousands of young Germans have been in training over a period of four or five years on gliders and on powered machines so that the probabilities are that at the outbreak of the European war Germany had the largest number of active and reserve pilots of any nation in the world. Since September it may be assumed that the production rate on pilots has been tremendously increased. As for the industry personnel, as early as 1936 it was known that well over 100,000 people were engaged in building aircraft and in building aircraft engines and accessories, a figure that was doubled by 1938 and probably trebled at the present time. As for morale (as defined above) unless extreme economic pressure is causing radical changes in internal affairs at the present time (Jan. 1, 1940), Germany must be given as high a ranking as any in Europe because of its system of absolute labour control and the improbability of production breakdown due to strikes and other similar causes.

England.—Although England let her aeronautical industries lag far behind Germany up to the close of 1938, she has been making a valiant effort to achieve something like parity with the German air force. Progress has been rapid during 1939, but she has not yet succeeded in closing the gap entirely. It seems unlikely that her air fleets would total more than 60% of Germany's at the present time, but her production rates are climbing rapidly and productive capacity is being expanded so that another year (assuming that no economic upset or military attack disrupts her manufacturing system) should bring equality. Her newest machines are all first rank as far as quality goes from a performance and production standpoint, but the Royal Air Force is hampered by having on its active rosters a large number of machines of designs dating back three or four years. This situation is being corrected but at the present time it is necessary to rank the general quality of the British machines slightly below that of the German. Great Britain is now in the midst of an elaborate training program to provide thousands of new pilots for the Royal Air Force. Also her industries are building up their man power, but in both respects England is lagging behind Germany by at least a year and perhaps longer. It will be some time before the great training program set up for Canada can have any influence on the active personnel in the Royal Air Force. Again, it will probably be at least a year before parity can be attained with Germany on both flying and ground personnel. As for morale, although there is nothing finer in the world than the morale of Great Britain's air force, her manufacturing industries are subject to the conditions which prevail in any democracy. Labour cannot be controlled as absolutely as in the totalitarian states and the production of necessary equipment and material is subject to interruption from

strikes and other types of labour disturbances. For that reason, the general industrial morale must be rated somewhat under that of Germany's at the present time.

Russia is still very much of a question mark because little accurate information is available. She undoubtedly has large numbers of aircraft but there are reasons to believe that the performance of these machines is not up to modern standards. Her production rate and production capacity are probably below those of Germany and England, and although her man power both in pilots and industrial personnel is probably the highest in Europe, the general state of unrest and disorganization in the Soviet Union puts the general morale rating toward the bottom of the list. Two years ago there was reason to believe that the Russian air force was the most powerful in Europe, but with changing conditions it seems unlikely that they rank higher than third at the present time.

Italy, although a neutral, probably controls the balance of air power in Europe. She has accumulated a considerable amount of equipment, personnel, and experience in her active campaigns in Ethiopia and in Spain. She has a relatively large number of aircraft on hand as a result of these campaigns, but from a performance and production point of view they are not comparable in quality with either the German or the British output. Production rate is also below either of those two countries and the actual capacity to produce is probably not appreciably greater than the actual output of the last two years. She probably has a relatively large number of trained pilots with a certain amount of active experience, but industrial personnel is limited both in number and in skill for producing modern aircraft. The Italian situation is somewhat similar to the German in that, as a totalitarian state, labour may be fairly well controlled although there are elements in the picture that make it necessary to scale the morale factor down below that of Germany, and even below democratic England under present conditions.

France has allowed her air force to slip back from the front ranking position which she retained from the ten years after the war of 1914-18 to no more than fifth place in European aviation. Although she carried large numbers of aircraft on active rosters up to a few years ago, most of those machines were obsolete and many of them were entirely out of commission. Due to unfortunate social and economic conditions of the past five years, she did not keep her aircraft-producing industries up to modern standards. This has been reflected in a very serious dropping off in the quality of French aircraft from a production point of view and has dropped the production rate to a figure far below either Germany or England in the pre-war years. Her productive capacity has also suffered, all of which has been reflected recently in the necessity for placing large orders for aircraft and engines in the United States to supplement her own limited output. At the close of 1938, at a time when Germany was producing 500-600 aeroplanes a month and England 200-300, French output was down to approximately 70 units per month. Since the outbreak of the war France has been increasing her personnel engaged in aviation both in pilots and in industry. The morale of her individual pilots is of a very high order, but the general social and working conditions of the past few years in France have reduced the industrial morale to probably the lowest level of any of the major European countries. Under emergency conditions improvements are now in evidence, but much ground has been lost in industry that will take some years to regain.

Based on the general conditions outlined in the preceding paragraphs, the accompanying table has been set up to measure the relative strength of the five European air forces as of the end of 1939. For each of the six elements of air power, ratings have been assigned to each country as compared with Germany, for at pres-



NEW YORK CITY'S \$40,000,000 NORTH BEACH AIRPORT as seen from the air during its dedication Oct. 15, 1939. In the foreground is the seaplane base with a transatlantic plane riding at anchor

ent the German air force must be the yard-stick against which air power in Europe must be measured. Total point scores of each country have been added and divided by six to give average ratings. (See also AVIATION, CIVIL; EUROPEAN WAR; STRATEGY OF THE EUROPEAN WAR.)

Relative Strength of Five European Air Forces, End of 1939

	Germany	England	Russia	Italy	France
Number of planes . . .	10	6	8	5	3
Quality . . .	10	9	5	6	5
Production rate . . .	10	7	4	4	2
Production capacity . . .	10	8	6	4	4
Personnel . . .	10	7	10	5	6
Morale . . .	10	8	6	7	6
Total points . . .	60	45	39	31	26
Average Score as of end of 1939 . . .	10.0	7.5	6.5	5.2	4.2
Average Scores at end of 1938 as published in Aviation, Jan. 1939 . . .	10.0	5.0	7.6	6.3	2.5

(S. P. J.)

Air Mail: see AVIATION, CIVIL; POST OFFICE.

Airports. While airport construction began during the World War, it was not given serious attention until a few years later, when civilian flying was found to be greatly hampered by inadequate landing facilities.

In its present usage "airport" is applied only to a flying field which has been graded, drained, and provided with the necessary buildings and facilities for housing and handling aircraft. "Flying field" is now applied to the portion of an airport which is used for taking off and landing and to unimproved areas which are used for flying operations. "Emergency field" is used to designate an area (generally small and having no buildings of conse-

quence) which is maintained for emergencies. Where regular service is operated it has become common practice to provide emergency fields along the route—which thus becomes an "airway." This began soon after the first regular services and has reached its highest development in the United States, where the Civil Aeronautics Authority by 1939 controlled 24,249mi. of domestic airways equipped with lights or radio beacons or both, and where the total of Federal-equipped airways will reach 29,199mi. in 1940. This system links together 1,145 municipal, State, and commercial airports, with an additional 258 Government emergency fields, and has a total of 728 airports and fields equipped for night flying. Part of this was constructed during the depression in connection with unemployment relief; during the past several years the U.S. Works Progress Administration aided in local airport work to the extent of more than \$112,000,000.

Many airports have runways 4,000 to 5,000ft. long; LaGuardia Field at North Beach, N.Y., has a 6,000-ft. runway and one of the new Tempelhof runways is about 7,500 feet. Airports with total areas of 750 to 1,000ac. are coming into existence—affording a vivid comparison with the 100 to 150ac. that were acceptable not much more than ten years ago.

Plan.—The arrangement most generally accepted for airports is that of grouping all buildings at one side of the plot in order that the other sides be free of obstructions. However, the plots vary so much in shape that each airport takes on its own individual characteristics and it becomes impracticable to call any one "typical." It is equally difficult to point to specific airports as "best" or "biggest," because of the constant improvement and the divergent conditions. Taking area as one criterion, the world's largest is probably Randolph Field, the U.S. Army training centre in Texas. This has a total area of about 2,300 acres of which some 500 acres are used for buildings. Cleveland Municipal Airport ranks as the largest civil airport with its total of 1,040 acres and

Le Bourget, with 812 acres is probably second. Most centrally located airports are Tempelhof (Berlin) and La Guardia Field (North Beach, New York city), the first being on a subway line and the second on a city boulevard. The Municipal Airport of Newark, N.J., has heretofore handled the greatest volume of civilian air traffic, with Chicago Municipal Airport second. However, the recent opening of La Guardia Field is now changing the relative status of these and preliminary figures indicate that this airport is likely to take the world lead in civilian traffic in 1940.

Airways Traffic Control.—Increased traffic brought also a need for some extension of airport control to airways, particularly to avoid collisions when visibility turns poor. In the United States a most complete system has been developed which is based upon radio communication with the pilots; airliners operating over important routes maintain regular communication with control stations along their routes. Through radio telephony the pilots are informed of weather changes, notified of the proximity of other aircraft and given flight orders. Flying along an airway each aeroplane is required to maintain its assigned altitude and to fly somewhat to the right of the centre of the airway as indicated by the signals emanating from its radio beacons. These beacons emit two signals which merge into a steady hum when the aeroplane is on the course, because it thus receives both signals with equal intensity.

Divergence to either side causes that signal to come in stronger than the other, thus informing the pilot when he is off his course as well as indicating the side to which he has drifted. Radio transmission has also been used for effecting "blind" landings of aeroplanes in Europe and the United States, and Germany actually had at least 16 of her civil airports equipped for "blind" landings by the end of 1938. The radio landing method depends upon reception of special local signals which are picked up when approaching the airport. These signals keep the pilot informed of his position and altitude with respect to the runway on which he is to land and make it possible to effect a landing with reasonable safety even in a fog. The difficult problem of choosing a standard system has delayed the general installation of such landing equipment in the United States to date. In 1938 perfection of the "terrain clearance indicator" was accomplished and this device should be of further aid in blind landings as it indicates the distance from the terrain below regardless of the altitude with respect to sea level. Noteworthy airport construction of the past several years includes the expansion at Le Bourget and at Croydon; the tremendous new building group at Tempelhof and New York's new airport of La Guardia Field at North Beach. This last mentioned project was constructed by the heroic method of filling in some 400ac. of Flushing bay to provide a total of 558ac. and permit runways up to 6,000ft. long. Built by the city with assistance of the U.S. Works Progress Administration, at a total cost of about \$40,000,000, to date, this airport was opened in October of 1939. Pan American Airways' chain of facilities across the Pacific still remains the most daring airport development of recent years. This organization now operates 62,889mi. of route, has 193 regular ports of call and (including other airports and emergency facilities) it has more than 300 bases in all. The Pacific chain includes many unusual airports, one being the Wake Island base which had to be constructed on a tiny and formerly uninhabited island over 1,000mi. from the nearest other land in the Pacific.

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monthly by U.S. Civil Aeronautics Authority; *Aeronautical World News*, published twice a month by the Bureau of Foreign and Domestic Commerce, U.S. Department of Commerce, Washington, D.C. (A. B.L.)

Air Races. John Livingston of Waterloo, Iowa, again won the important Glenn H. Curtiss Trophy flight at the Miami, Fla., meet, flying 156-806 m.p.h. in the race for planes of 850-inch-or-less piston displacement. Anthony Levier of Montebello, Calif., was second, and Steve J. Wittman of Oshkosh, Wis., third.

In the women's feature at Miami, the K. K. Cluver Trophy race, Mrs. Edna Gardner of New Orleans, La., was the first to cross the finish line in her 125 h.p. monocoupe, averaging a speed of 117.2 miles per hour. Miss Edith Dexcomb of Hartford, Conn., was second, and Mrs. Bessie Owens of Santa Barbara, Calif., third. The actual fastest time was attained by Mrs. Owens who flew 147-017 m.p.h. in her powerful Beechcraft.

The famed Bernarr Macfadden Trophy with a cash prize of \$2,000 for the winning flier in the race from New York to Miami went to Max Constant of Hollywood, California. Lieutenant Commander Russell Holderman was second. Constant flew Miss Jacquelin Cochran's Beechcraft and covered the 1,195mi. in 5hr. and 43min., 39 seconds. His average speed was 204.227 miles per hour. J. H. Woods of Charlotte, N. C., won the Firestone Trophy.

Colonel Roscoe Turner again won the Thomson Trophy race falling just short of his 1938 record. He triumphed at the National Air Races at Cleveland, Ohio, and at the conclusion of the meet announced that he would retire from air racing, which he termed a "young man's game" to open a flying school in Indianapolis.

(T. J. D.)

Air Raid Precautions: see COAL INDUSTRY; *Great Britain*; ELECTRIC LIGHTING; EUROPEAN WAR; PARIS.

"Ajax": see EUROPEAN WAR; SUBMARINE WARFARE.

A. L. A.: see AMERICAN LIBRARY ASSOCIATION.

Alabama, one of the "deep South" States of the United States, admitted to the Union 1819; area, 52,250 sq.mi.; population (U.S. census, 1930) 2,646,248; estimated Jan. 1, 1940, at 3,000,000. Capital, Montgomery, 66,079. Cities with larger population are Birmingham, 259,678, estimated Jan. 1, 1938, 300,000, and Mobile, 68,202 (1930), estimated 80,000, Jan. 1, 1939. Of the State's population 744,278 were urban (1930), or 28.1%; 1,700,775 whites; 944,834 coloured; 2,630,370 native born; 15,878 foreign born.

History.—The most striking fact in the State's modern economic history has been the rise of manufacturing and transportation development. In politics the Democratic Party has dominated. The Republican Party has persisted since 1868, but has exerted little influence in State politics. Alabama has had five constitutions, those of 1819, 1865, 1868, 1875, and 1901. The constitution of 1901 contained notable innovations: the term of executive and legislative officials was extended from two to four years and executive officers cannot succeed themselves. By an amendment, July 1939, legislators are to be elected biennially. Twenty-four of the 67 counties now permit the sale of hard liquors. The traffic is under the supervision of the Alcoholic Beverage Control Board.

Chief officers of the State elected for service beginning Jan. 16, 1939 are: governor, Frank M. Dixon; lieutenant-governor, A. A. Carmichael; State auditor, Howell Turner; secretary of State, John Brandon; State treasurer, C. E. McCall; attorney-general, L. J. Lawson; superintendent of education, A. H. Collins; commissioner of agriculture and industries, Haygood Paterson.

Education.—A well defined system of elementary and high schools and colleges for both races is maintained. Elementary education is free between the ages of 6 and 21, and compul-

sory between the ages of 8 and 16. State appropriations in 1939 amounted to \$13,025,821. Total revenues from all sources were approximately \$25,229,779. Illiteracy among whites between 10 and 20 years is 1.9%, coloured 2.6%. There are seven State-supported institutions of higher education for whites and three for Negroes. Several colleges are maintained by the Methodists, Baptists, and Catholics.

Charities and Correction.—The State supports many philanthropic and penal institutions: institutions for the deaf and blind of both races; hospitals for the insane of both races; a school for feeble-minded children; training schools for wayward white boys and girls; and a reformatory school for Negro boys; a child welfare department; juvenile courts; a model State prison and a penitentiary system in which the State provides employment for its convicts.

Banking and Finance.—In 1938 there were 65 national banks with a capital of \$21,225,000, deposits of \$122,301,000 and total assets of \$155,707,000; 152 State banks with a capital of \$14,958,158, deposits of \$77,817,875, and total assets of \$94,065,444. Revenue sources include a property tax, income tax, sales tax, privilege taxes, and levies on gasoline, tobacco, beer, and liquor. Receipts for the fiscal year ending Sept. 30, 1938, were \$55,987,312; disbursements, \$57,239,498; State debt, \$68,100,000.

Agriculture, Manufactures, Mineral Production.—Alabama ranked second among the cotton-planting States in 1860. Many crops are produced in large quantities, but cotton is still the most important one. The State had an estimated output of 1,080,000 bales in 1938. In 1935 there were 273,455 farms covering 19,660,828 ac. with lands and buildings valued at \$368,219,654.

In 1929 there were 2,848 establishments hiring 132,200 workers and producing goods valued at \$560,378,132. In 1937 there were 1,781 establishments, but industrial payrolls and employment almost reached 1929 levels. Twenty-five industries were established with an invested capital of about \$50,000,000. The two great basic industries are cotton textiles and iron and steel. Other important industries are lumber, blast-furnace products, cast-iron pipes and fittings, cotton-seed oil and meal, coke-oven products, cement, and electric power. The manufacture of electricity is one of the State's most important industries. The capacity of the generating plants of the Alabama Power Company is about 900,000 h.p., and the TVA plants in the State are capable of producing slightly more. There are about 6,000 mi. of rural electric lines. The mineral output of the State was valued at \$53,518,993 in 1937 with coal and iron ore leading. (A. B. Mo.)

Alaska. Alaska, in its greatest extent is included between the meridians of 130° West longitude and 173° East longitude and between the parallels of 51° and 72° North latitude. It is bounded on the north by the Arctic ocean; on the west by the Arctic ocean, Bering strait, and Bering sea; on the south and south-west by the Gulf of Alaska and the Pacific ocean; and on the east by the Yukon Territory and British Columbia. The eastern boundary, from the Arctic ocean to the neighbourhood of Mount St. Elias, is the 141st meridian; thence south-eastward to Portland canal it is irregular and cannot be described in general terms, except that it runs approximately parallel to the irregular shore line and about 30 miles therefrom.

Alaska is in approximately the same latitude as the Scandinavian peninsula; Point Barrow, its northernmost point, is in about the same latitude as North Cape; Dixon Entrance, which marks its southern boundary, is nearly on the same parallel as Copenhagen; St. Elias is in the latitude of Oslo and Leningrad; and Sitka is in the latitude of Edinburgh. The longitude of the western terminal of the Aleutian islands is almost identical with that of the New Hebrides islands and is the same as that of New Zealand,

and Cape Prince of Wales, the most westerly point of the mainland, is nearly as far west as the Samoan islands. Thus a person travelling from New York to Attu island, the westernmost of the Aleutian chain, on reaching San Francisco will have accomplished less than half the journey from east to west.

The area of Alaska is about 586,400 sq. mi., one-fifth that of the United States. A map of Alaska superimposed on a map of the United States of the same scale, demonstrates that the distance from the easternmost to the westernmost point in Alaska is equal to the distance from the Atlantic to the Pacific in the latitude of Los Angeles, and that its northernmost and southernmost points are nearly as far apart as the Mexican and the Canadian boundaries of the United States.



ERNEST H. GRUENING, appointed governor of Alaska Sept. 2, 1939

Alaska's chief products are fish, metals, and fur. In 1939, fish and fish products shipped from the Territory were valued at \$42,869,726. Of this amount \$36,636,897 represents the value of canned salmon alone, which is the principal industry of the Territory.

The total value of mine products shipped to the United States in 1939 was \$28,607,000, of which the gold shipments amounted to \$23,170,000. Furs valued at a total amount of \$2,829,500 were shipped from Alaska during the calendar year 1938, a decrease of nearly \$485,000 from the previous year.

In the continued development of Alaska, the prime necessity is to improve transportation, primarily through the expansion of aeronautical developments, but also by extending roads to open up new areas for mining and possibly for agricultural development—although the opportunities in this latter field are distinctly limited.

The outlook for further aerial development is promising. Trial flights have been made between Seattle and Juneau. It is hoped that in the near future regular scheduled flights will connect the States with the Alaskan capital, and connect there with existing scheduled air service to Fairbanks. The Matanuska colonization project may still be considered in the experimental stage.

Tourist travel continues to increase and, during the summer of 1939, all ships supplying Alaska carried capacity loads. The need for added transportation facilities is becoming more apparent each year, and as rapidly as new ships and hotel accommodations are provided, a continued increase in travel may be expected. A hotel accommodating approximately 200 persons, has been constructed by the Alaska railroad at the entrance of Mt. McKinley National Park, and was opened for business at the beginning of the 1939 summer season. It is hoped within the next year to extend this development by construction of a lodge and cottage within the park, at the end of the 90-mile highway which leads from McKinley Park station to Wonder lake, where a magnificent view of Mt. McKinley and neighbouring peaks may be secured. (E. GRU.)

Albania. Area 10,632 sq. mi.; pop. (est. Dec. 1937) 1,038,000; chief towns: Tirana (30,806); Scutari (29,206); Elbasan (13,796). Lieut.-General: F. Jacomoni di San Savino; language: Albanian; religion: Mohammedan.

History.—January 1939 saw Albania enjoying her 27th year of

independence but tension with Italy developed and in March demands were made which King Zog could not accept as consistent with national sovereignty. They included the use of the ports by Italy for military purposes.

In spite of previous disclaimers of aggressive intentions, on Good Friday, April 7 (three days after the birth of King Zog's heir, Prince Skender), Italian forces landed at the four principal ports. Resistance was offered but owing to lack of cohesion it was serious only at Durres. King Zog fled with some supporters. The shrewd Albanian population soon accepted the dictates of a force which it could not hope successfully to oppose. A provisional government was formed from Italophile elements, the existing constitution was abrogated by a hastily improvised national assembly and the throne offered to King Victor Emmanuel. The Italian Government explained its invasion as necessary to "restore order" and "to free the friendly Albanian people from a tyrannical clique."

Signor Jacomoni, previously minister at Tirana, was appointed lieutenant-general, or viceroy. By the new constitution, promulgated on June 4, Albania remains a nominally independent kingdom under the Crown of Italy.

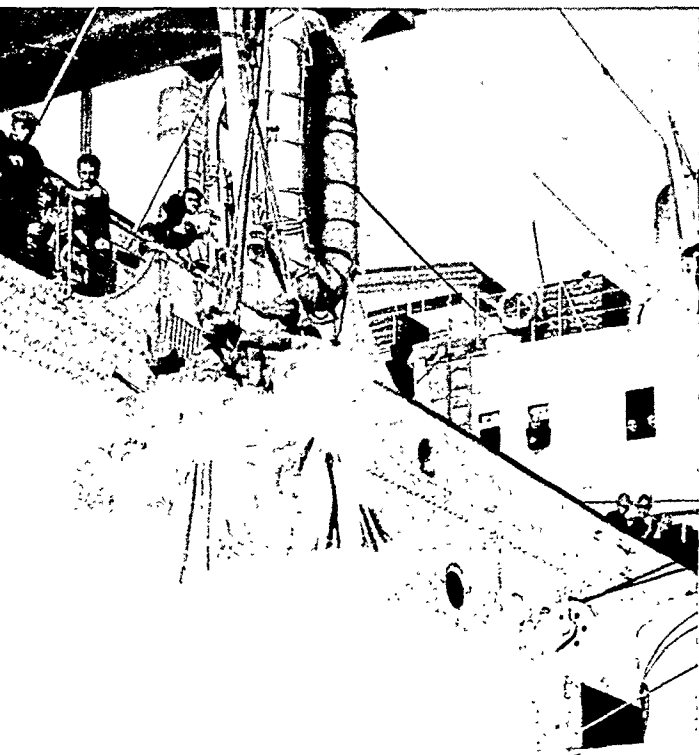
Parliament was replaced by a Fascist High Corporative Council; an Albanian fascist party was formed; the army and gendarmerie were reduced to a shadow and a fascist militia created. It is claimed that a program of public works, chiefly road building, has found work for all.

It is too early to assess the historical significance of this incursion by Italy into Balkan territory. The effect on Yugoslavia was to intensify her neutrality when the European war clouds broke in September.

The immediate anxiety aroused in Greece was subsequently eased by diplomatic action.

(D. R. O. H.)

LOWERING TROOPS from an Italian liner at Santi Quaranta, near Durazzo, during the occupation of Albania April 7-9, 1939



Banking and Finance.—Revenue and expenditure (est. April 1, 1939) to June 30, 1940=15 months, each 40,000,000 gold francs.

Trade.—Overseas trade (merchandise) 1938: imports, 22,979,890 gold francs; exports 9,749,959 gold francs.

Agriculture.—Production 1938 (in metric tons): wheat 44,910; maize 155,345; oats 11,256; barley 4,975; also vineyards, olive oil, livestock, fuel oil, bitumen, and fruits. (See also BALKAN ENTENTE; ITALY: History.)

Alberta, the most westerly of the prairie provinces of Canada, Alberta was created a province by Act of the Dominion Parliament, Sept. 1, 1905. The province has a total area of 255,285 sq.mi. and a population of 789,000 (estimate, Dominion Bureau of Statistics, 1939). The seat of government is Edmonton.

History.—The Social Credit Government, under the leadership of William Aberhart, was elected to office Sept. 3, 1935. Since that time all attempts to put the proposed Social Credit plan into effect have been unsuccessful. The Provincial Government has now (Jan. 1940) applied to the Dominion Government for a charter to set up a province-wide branch banking system through which it hopes to initiate the scheme. In the meantime, the premier has announced his intention of appealing to the electorate early in 1940.

Finance.—Since the first default of April 1937 the Government has continued to refuse to meet its obligations in respect to matured bond debts. The total bonded debt of Alberta is \$127,999,260.

Economic.—Although more diversified than its neighbour province of Saskatchewan, Alberta relies largely on its grain crops. The year 1939 was slightly better than 1938.

The wheat crop for the year 1939 was 150,000,000bu. as compared with 143,000,000 in 1938. Other grain crops were, in bushels, oats, 82,000,000 (101,000,000, 1938), barley, 27,000,000 (29,200,000, 1938), rye, 2,400,000 (2,700,000, 1938), and flaxseed 340,000 (250,000, 1938). The aggregate farm capital of the province, which includes land, buildings, implements, and livestock is estimated as of 1938 at \$676,614,000.

Other main sources of income were from minerals \$28,966,272, from manufacturing \$86,225,069 and from the fisheries \$492,943 for 1938. From statistics available for 1939 it appears these figures will be surpassed for the year.

Petroleum.—At the end of the year 1939 there were 100 oil wells in operation in the Turner Valley as compared with 65 at the end of 1938.

As a result of this development the production of crude petroleum reached an all-time high of 6,603,374bbl. for the ten months ended October 31, although the production was pro-rated by the Petroleum and Natural Gas Conservation Board among the producing wells so as not to overload the refineries or glut the available market.

The Royal Commission, set up in 1938 to investigate the whole of the oil industry, and to report on the advisability of the Government taking over the wholesale and retail distribution of all petroleum products produced in Alberta, did not up to Jan. 1, 1940 make its report public. (J. T. C.)

Alcoholic Intoxication: see INTOXICATION, ALCOHOLIC.

Alcoholic Liquor: see BREWING AND BEER; LIQUORS, ALCOHOLIC.

Alexandretta, Sanjak of: see EUROPEAN WAR; TURKEY.

Alfalfa. The crop of alfalfa hay in the United States in 1939 was estimated by the Department of Agriculture October 1 as 27,139,000 tons, or 6% less than the 1938 crop of

28,858,000 tons, and 13% above the 10-year average.

Production of Alfalfa Hay by States, 1938 and 1939

	1939 Tons	1938 Tons		1939 Tons	1938 Tons
California . . .	3,165,000	3,105,000	Texas	230,000	205,000
Minnesota . . .	2,400,000	2,715,000	South Dakota . . .	220,000	316,000
Wisconsin . . .	2,056,000	2,758,000	New Mexico . . .	218,000	218,000
Iowa	1,800,000	1,980,000	Mississippi . . .	150,000	152,000
Idaho	1,874,000	1,992,000	Arkansas	124,000	135,000
Michigan	1,650,000	1,720,000	Virginia	124,000	116,000
Colorado	1,256,000	1,388,000	Tennessee	122,000	127,000
Montana	1,093,000	1,083,000	North Dakota . . .	108,000	140,000
Ohio	1,024,000	953,000	New Jersey	100,000	110,000
Illinois	987,000	932,000	Maryland	65,000	71,000
Nebraska	923,000	1,144,000	West Virginia . . .	54,000	49,000
Utah	902,000	983,000	Louisiana	40,000	36,000
Indiana	826,000	801,000	Connecticut	30,000	50,000
Washington . . .	720,000	700,000	Vermont	28,000	29,000
Kansas	686,000	690,000	Massachusetts . . .	17,000	19,000
Oregon	660,000	673,000	North Carolina . .	14,000	16,000
Wyoming	532,000	569,000	Delaware	14,000	13,000
Arizona	470,000	406,000	Georgia	13,000	11,000
New York	453,000	587,000	Maine	8,000	8,000
Missouri	452,000	334,000	New Hampshire . .	6,000	6,000
Oklahoma	432,000	456,000	Alabama	6,000	6,000
Pennsylvania . .	361,000	430,000	South Carolina . .	3,000	3,000
Kentucky	317,000	304,000	Rhode Island . . .	2,000	2,000
Nevada	290,000	308,000			

(S. O. R.)

Algeria: see FRENCH COLONIAL EMPIRE.

Aliens: see IMMIGRATION; LAW (CASE): *Aliens*.

Alimentary System, Disorders of. *The Œsophagus.*

—In six of the seven cases reported by Chamberlain, either a congenitally short Œsophagus, or diaphragmatic hernia, or both, were present. The numerous references to hiatus or diaphragmatic hernia in the current literature attest its frequency as well as the necessity of excluding this condition as the cause of otherwise unexplainable gastric, Œsophageal, or cardiac disturbances, especially in middle-aged, obese individuals. The observations of Adams and his co-workers not only denote that there is continued interest in the surgical treatment of Œsophageal carcinoma, but that a standardized procedure may ultimately be evolved for the successful treatment of what now is generally regarded as an inoperable condition.

The Stomach and Duodenum.—Following an extensive study of gastric carcinoma, Robertson and Judd concluded that this disease develops in a previously damaged stomach, especially as the result of ulcerative gastritis. In their opinion the pathogenesis of carcinoma is directly associated with a disorganized hyperplasia of the mucous cells. Modern concepts stress the importance of the effect of lesions of the brain, alterations in incretory or hormonal activity and the psyche mediated through the autonomic nervous system in the genesis of gastroduodenal ulcer.

Significant contributions to the all important subject of early gastric carcinoma have been made by Comfort and Butch, MacCarty, and Schindler. Gutmann and his associates are the authors of a volume dealing exclusively with the disease in its early stages. MacCarty reports observations on 128 relatively small cancers, 2.5cm. in diameter or smaller, and emphasizes the point that there were no pathognomonic symptoms or signs of cancer. It is evident that the recognition of cancer in its earlier stages can be and is being made with increasing frequency. Klein and Palmer minimize the menace of carcinomatous transformation of a benign ulcer. Investigations relative to the physiologic factors regulating gastric acidity and gastric motor activity, to the development of improved gastric test meals, and to a better understanding of the important pathways of conduction of pain from, and the mechanism of production of pain in the viscera of the upper part of the abdomen, are of particular interest because of their diagnostic and therapeutic implications. In this respect the contributions of Hollander, Wilhelmj, Apperly, Shay, Rivers, Jones, and their collaborators, are noteworthy.

Accumulating experience attests the indispensability of gastro-

scopy as a routine diagnostic procedure and it bids fair to soon enjoy the same prominence in English-speaking countries as it has on the European continent for the past decade or longer. To the clinician with a wealth of material at his disposal it is evident that chronic gastritis in its various forms is a common disorder, frequently giving rise to symptoms indistinguishable from the more familiar gross lesions. Gastroscopy also serves many other important functions. Colour photography of selected sites of the gastric wall has been successfully developed by Henning and Keilhack.

Nonsystemic antacids, such as magnesium trisilicate, tertiary calcium and magnesium phosphates, and colloidal aluminium gel, are gradually replacing the absorbable antacids in order that alkalosis, rebound secretion, and other undesirable reactions may be avoided. The constant drip apparatus is becoming increasingly popular.

The Biliary Tract and Pancreas.—Treatment of the deficiency of prothrombin in jaundiced states as well as in various intestinal disorders with antihaemorrhagic vitamin K represents a brilliant therapeutic triumph. Two milligrams of the new synthetic preparation of 2-methyl-1,4-naphthoquinone given intravenously, or orally with the addition of bile salts, will promptly correct abnormally low levels of prothrombin from whatever cause. The results of six years of research with respect to pancreatic function by means of the secretin test and special double-lumen tube, has been reported by Lagerlöf. Through the medium of a special double-lumen tube and continuous separate aspirations of gastric and duodenal secretion and saliva, using a brand of secretin freed of cholecystokinin and histamine as a stimulus, a promising clinical test for pancreatic function has been developed. Conclusions are based on the volume of pancreatic juice recovered, its bicarbonate content, and its enzymes. Among the last the diastase possesses the highest functional significance. The present procedure of choice in acute cholecystitis is immediate operation; that of acute pancreatitis, on the contrary, is nonsurgical. Elman, Gray, and their co-workers, describe transient or non-haemorrhagic types of acute pancreatitis and point out the importance of blood amylase studies in diagnosis. Berg reports other features such as hypochloraemia, electrocardiographic changes, and roentgenologic phenomena characterized by fan or band-like shadows in the region of the hylus of one or both lungs.

The Intestines.—Miller, Abbott, Shay, and their associates, confirm the usefulness of intubation in the study of isolated intestinal segments under physiologic conditions as well as conservative decompression in simple obstruction and in determining the presence and site of lesions of the small bowel which may require surgical intervention. Verzá's theory of absorption from the intestines is apparently supported by the results of the galactose absorption test of Althausen. This shows that intestinal absorption may be increased by certain diseases, such as hyperthyroidism and Paget's disease, and decreased by myxedema, Addison's disease, and vitamin deficiency states. Weber has shown that improved technique and increased experience makes possible the more frequent recognition not only of neoplasms but such non-neoplastic processes in the small bowel as tuberculosis, regional enteritis, diverticulae, and changes produced by deficiency states. Otherwise unexplainable diarrhoea, bleeding, or persistent abdominal pain are important indications for roentgenologic examination of the small bowel. Newer remedies include the use of atabrin for giardiasis, didoquin in amoebiasis, oxygen inhalation for gaseous distension, and neoprontosil for chronic ulcerative colitis in its earlier stages. (See also VITAMINS.)

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All-American Canal: see AQUEDUCTS.

Allergy. While studies of the blood constituents in hay fever (Bruger and co-workers), a much more promising field indicating a possible disturbance in electrolyte and water metabolism is suggested by the work of Cook and Stoesser.

Among the recently described causes for allergic symptoms are the following: sugar beet pollen causing hay fever (Dutton); pine pollen, previously considered innocuous, causing asthma (Rowe); limonene in celery causing dermatitis in 30% of celery workers (Henry); karaya gum causing hives (Bowen); citrus fruit causing thrombopenic purpura (Dutton); wood smoke, acting not as an irritant, but as a specific cause of asthma (Rappaport and Hecht).

Continuous search for means to relieve chronic asthma has yielded new and valuable measures.

The modification of epinephrine solution to delay its absorption after injection into the tissues produces relief for as long as 24 hours instead of the two to four hours with the ordinary solution. This is accomplished by incorporating the drug in oil (Keeney and co-workers) or in gelatin (Spain and co-workers). A simplified mask for helium administration is described by Maytum for intractable attacks of asthma.

Reviewing the effect of X-ray treatment of a large number of asthma patients, Maytum and Leddy conclude that partial to complete but temporary relief occurs in half of the group. The treatment should be limited to those who fail to respond to other methods.

In hay fever intranasal spraying with gradually increasing concentrations of pollen solutions is reported to increase resistance against pollen (Francis). Oral administration of pollen was found ineffective (Zeller).

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Alloys: see MAGNESIUM; MOLYBDENUM; MONAZITE; NICKEL; TITANIUM; VANADIUM; CHEMISTRY, APPLIED.

Almonds: see NUTS.

Aluminium or Aluminum. The most important developments of recent years in connection with aluminium all centre around the problem of meeting the larger demand as the metal has been adopted for a rapidly growing list of new uses, resulting in the opening up of new ore deposits (see BAUXITE), the expansion of output by old producers, and the establishment of considerable new production. There have been marked increases in the outputs of Germany and Italy, and six new countries have been added to the producer's list:

Spain in 1929, the Soviet Union in 1932, Japan and Sweden in 1934, Hungary in 1935, and Yugoslavia in 1937.

World production in 1938 totalled 562,000 metric tons, distributed as follows:

Germany 165,600 tons; United States 130,000; Canada 55,000; U.S.S.R. 44,000; France 43,000; Switzerland 28,000; Norway 28,000; Italy 25,800; Great Britain 24,000; Japan 13,000; Sweden 1,800; Hungary 1,500; Yugoslavia 1,300; and Spain 800 tons.

The 1938 total was 17% higher than that for 1937, and 1939 is expected to show another increase.

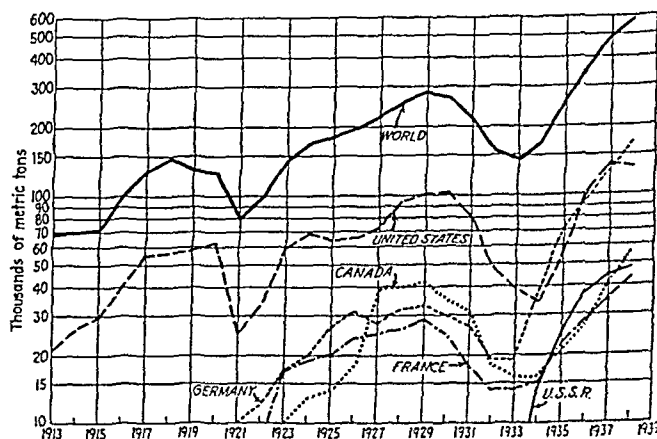
Germany again leads in the 1938 output with 30% of the total, and a 30% increase over 1937, while the United States dropped 2%.

New uses continue to expand, most of which depend on the lightness, strength, and corrosion resistance of the metal or its alloys, with cable for electrical transmission and transportation equipment especially active.

Sales in the United States in 1939 are reported to have made a new high record.

(See also CRYOLITE; METALLURGY.)

(G. A. Ro.)



ALUMINIUM PRODUCTION OF THE WORLD and the chief producing countries, as compiled by The Mineral Industry

Ambassadors and Envoys.

The following is a list of Ambassadors to and from the United States and to and from Great Britain at the beginning of 1940.

To and From the United States

(* = ambassadors; unstarred, envoys.)

To the United States	Country	From the United States
*Espil, Felipe A.	Argentina	*Armour, Norman
*Straten-Ponthoz, Count Robert van der	Belgium	*Davies, Joseph E.
Guachalla, Dr. Luis F.	Bolivia	Jenkins, Douglas
*Martins, Carlos.	Brazil	*Caffery, Jefferson
Naoumoff, Dimitri	Bulgaria	
Christie, Loring C.	Canada	
*Cabero, Alberto.	Chile	*Bowers, Claude G.
*Hu Shih, Dr.	China	*Johnson, Nelson T.
*Turbay, Dr. Gabriel	Colombia	*Braden, Spruille
Castro Beeche, Ricardo	Costa Rica	Hornibrook, William H.
*Martinez Fraga, Dr. Pedro	Cuba	*Messersmith, George S.
Hurbán, Vladimir	Czechoslovakia	
Kauffmann, Henrik de.	Denmark	Atherton, Ray
Pastoriza, Andrés	Dominican Rep.	Norweb, R. Henry
*Alfaro, Capt. Colón E. ¹	Ecuador	Long, Boaz
Hassan Bey, Mahmoud	Egypt	Fish, Bert
Brennan, Robert	Eire (Ireland)	Cudahy, John
Castro, Dr. Hector D.	El Salvador	Frazer, Robert
Kaiv, Johannes ²	Estonia	Wiley, John C. ³
Procopé, Hjalmar J.	Finland	Schoenfeld, H. F. Arthur
*Saint-Quentin, Count de	France	*Bullitt, William C.
*Dieckhoff, Hans H. (Absent)	Germany	
*Lothian, Marquess of	Great Britain	*Kennedy, Joseph P.
Sicilianos, Demetrios	Greece	MacVeagh, Lincoln
Recinos, Dr. Adrian	Guatemala	Des Portes, Fay A.
Lescot, Elie	Haiti	Mayer, Ferdinand L.
Caceres, Dr. Julian R.	Honduras	Erwin, John D.
Pelényi, John	Hungary	Montgomery, John F.
Hadjeb-Davallou, H. ⁴	Iran	Dreyfus, L. G., Jr.
*Colonna, Ascanio d.p.	Italy	*Phillips, William
*Horinouchi, Kensuke	Japan	*Grew, Joseph C.
Bilmanis, Dr. Alfred	Latvia	Wiley, John C. ³
Zadeikis, Povilas	Lithuania	Norem, Owen J. C.
*Castillo Nájera, Dr. Francisco	Mexico	*Daniels, Josephus
Loudon, Dr. A.	Netherlands	Gordon, George A.
De Bayle, Dr. León	Nicaragua	Nicholson, Meredith
Munthe de Morgenstierne, Wilhelm	Norway	Harriman, Mrs. J. Borden
*Boyd, Dr. Augusto S. (Absent).	Panama	*Dawson, William
Fernández, Dr. Horacio A.	Paraguay	Howard, Findley B.
*Freyre y Santander, Manuel de	Peru	
*Potocki, Count Jerzy	Poland	*Biddle, Anthony

Bianchi, João A. de	Portugal	Pell, Herbert C.
Irimescu, Radu	Rumania	Gunther, Franklin M.
*Cárdenas, Juan F. de	Spain	*Weddell, Alexander W.
Boström, W.	Sweden	Sterling, Frederick A.
Bruggmann, Charles	Switzerland	Harrison, Leland
Abibhal Rajamaitri, Phya	Thailand	Neville, Edwin L.
*Ertégün, Mehmet M.	Turkey	*MacMurray, John Van A.
Close, Ralph W.	Union of South Africa	Keena, Leo J.
*Oumansky, Constantine A.	U.S.S.R.	*Steinhardt, Laurence A.
Richling, J.	Uruguay	Wilson, Edwin C.
*Escalante, Dr. Diógenes	Venezuela	*Corrigan, Frank P.
Fotitch, Constantin	Yugoslavia	Lane, Arthur B.

¹Rank of ambassador for duration of boundary negotiations between Ecuador and Peru.

²Acting consul general, in New York City.

³Accredited to both Estonia and Latvia; resident at Riga.

⁴Chargé d'affaires.

To and From Great Britain

(* = Ambassador; unstarred = Envoy-Extraordinary; † = Minister-Plenipotentiary; ‡ = Minister Resident; § = Chargé d'Affaires; || = Consul-General; ¶ = Consul.)

To Great Britain	Country	From Great Britain
Sardar Ahmed Ali Khan	Afghanistan	Fraser-Tyler, Lt.-Col. Sir W. K.
*Le Breton, Dr. Tomás A.	Argentina	*Ovey, Sir Esmond
*de Marchienne, Baron E. de C.	Belgium	*Olliphant, Sir Lancelot
Patiño, Antenor	Bolivia	Verker, G. C. M.
*de Oliveira, Raul Régis	Brazil	*Knox, Sir Geoffrey G.
Montchiloff, Nicholas.	Bulgaria	Rendel, G. W.
*Señoret, Octavio	Chile	*Bentinck, Sir C. H.
*Quo Tai-chi	China	*Kerr, Sir Archibald Clark
Camacho-Angarita, Dr. Alberto	Colombia	Paske-Smith, M. B. T.
(Vacant)	Costa Rica	Shuter Dodd, C. E.
de Blanck, Guillermo	Cuba	Ogilvie Forbes, Sir G. A. D.
*Lisický, Karel	Czechoslovak Republic	
Reventlow, Count Eduard	Denmark	Smith, C. H.
Henríquez-Ureña, M.	Dominican Republic	† Paterson, A. S.
Sotomayor Luna, Manuel	Ecuador	Bullock, C. H.
*Hassan Nashat Pasha	Egypt	*Lampson, Sir Miles

To Great Britain	Country	From Great Britain
Schmidt, August	Estonia	Orde, C. W.
Gripenberg, Georg	Finland	Snow, T. M.
*Corbin, Charles	France	*Campbell, Sir Ronald H.
(Withdrawn)	Germany	(Withdrawn)
Simopoulos, Charalambos	Greece	Palaiet, Sir Charles M.
§ Figueroa, Dr. Francisco A.	Guatemala	§ Leche, J. H.
† Magloire, Clement	Haiti	† Hillier, R. A. N.
† de Telepnef, B. Basilio	Honduras	§ Leche, J. H.
de Barcza, George	Hungary	O'Malley, O. St. C.
Ali Shicily	Iran	Bullard, Sir R. W.
Sayid Raouf al Chadirji	Iraq	*Newton, Sir B. C.
*Bastianini, Giuseppe	Italy	*Loraine, Sir P. L.
*Mamoru Shigemitsu	Japan	*Craigie, Sir Robert L.
Zarins, Charles	Latvia	Orde, C. W.
† de Lynden, Baron Robert Aernout	Liberia	§ Ponsonby, A. G.
Balutis, Bronius	Lithuania	Orde, C. W.
(Vacant)	Luxemburg	Cliphant, Sir Lancelot
	Mexico	
Lt.-Gen. Krishna Shumshere Jung	Nepal	Betham, Lt.-Col. G. L.
Bahadur Rana	Netherlands	Bland, Sir N.
van Verduynen, Dr. Michiels	Nicaragua	§ Leche, J. H.
Herdacia, Dr. C.	Norway	Dormer, Sir Cecil F. J.
Colban, E. A.	Panama	Shuter Dodd, C. E.
§ Lefevre, Jose Ehrman	Paraguay	Ovey, Sir Esmond
(Vacant)	Peru	Forbes, V. C. W.
Benavides, A.	Poland	*Kennard, Sir H. W.
*Raczyński, Count Edward	Portugal	*Selby, Sir Walford H. M.
*Monteiro, Dr. Armando Rodrigues	Rumania	Leeper, R. W. A.
de Ittau	Salvador	§ Leche, J. H.
Tilea, V. V.	Saudi Arabia	Stonehewer-Bird, F.H.W.
(Vacant)	Spain	*Peterson, Sir Maurice
Sheikh Hafiz Wahba	Sweden	Mallett, V. A. L.
*The Duke of Alba	Switzerland	Kelly, D. V.
Prytz, Björn Gustaf	Thailand	Crosby, Sir J.
Thurnheer, Walther	Turkey	*Knatchbull-Hugessen, Sir H. M.
Phya Rajawangsang	Uruguay	Millington-Drake, E.
Aras, Dr. Tewfik Rüştü	United States	*The Marquess of Lothian
Castellanes, Dr. Daniel	U.S.S.R.	*Seeds, Sir W.
*Kennedy, Joseph P.	Vatican	Osborne, F. D'A. G.
*Maisy, I. M.	Venezuela	Gainer, D. St. C.
Godfrey, Mgr. W.	Yugoslavia	Campbell, Sir R. H.
(Apostolic Delegate)		
Carnevali, Dr. Atilano		
Subotitch, Ivan		

American Academy of Arts and Letters

was organized in 1904 by the National Institute of Arts and Letters, a body which was organized in 1898 by the American Social Science Association. From Nov. 1938 to May 1939 an exhibition of the Works of Charles Adams Platt, a member of the Academy who died in 1933, was held in its art gallery. This was followed by an exhibition of Childe Hassam, a member of the Academy who died in 1935; at the same time an exhibition was open in the administration building of paintings of Edwin Austin Abbey, a member of the Academy whose death occurred in 1911. These paintings were lent by Yale University. There is one vacancy in the Academy caused by the death of Sidney Coe Howard. The officers elected in 1938 are: Nicholas Murray Butler, president; Wilbur L. Cross, chancellor and treasurer; William Lyon Phelps, secretary. The other six directors elected were: Herbert Adams, Royal Cortissoz, Charles Dana Gibson, Robert Grant, Charles Downer Hazen, and Archer Milton Huntington. (G. D. V.)

American Academy of Arts and Sciences.

The Academy is limited to 800 fellows and 130 foreign honorary members, divided among four classes: I, Mathematical and Physical Sciences; II, Natural and Physical Sciences; III, The Social Arts; IV, The Humanities. The officers for the year 1939-40 are: president, Harlow Shapley; corresponding secretary, Leigh Hoadley; recording secretary, Hudson Hoagland; treasurer, Horace S. Ford. The following papers were presented at regular monthly meetings: George H. Parker, "Modern Views on the Action of the Nervous System"; George Sarton, "The Function of Academies, Past and Present"; Hudson Hoagland, "Some Aspects of Electrical Brain Waves"; Dr. A. Forbes, "Aerial Photography and Map-making"; C. M. Spofford, "Contributions on

the Development of Bridges"; S. Foster Damon, "The Fatigue of Burgwine"; L. J. Henderson, C. C. Brinton, E. B. Wilson—Symposium: "What Constitutes Social Progress?"; A. Krogh, "Programs of Instruction on Physiology."

The following papers were read by title, and will appear presently in the *Proceedings*: "Chang Po-Tuan: Essay on the Understanding of Truth." T. L. Davis and Chao Yün-Ts'ung; "Gyro-magnetic Ratios for Ferromagnetic Substances, New Determinations." S. J. Barnett; "Some Physical Constants of a Few Hydrocarbons and their Structural Isomers." M. Wojciechowski; "Interatomic Forces and Helium in Rocks." N. B. Keevil; "Sera-phidae in Baltic Amber," C. T. Brues; "Fossil Parasitic Hymenoptera of the Family of Calliceratidae in Baltic Amber," C. T. Brues. Grants in aid of research were made from the Rumford Fund, the C. M. Warren Fund, and from the Permanent Science Fund; 32 awards amounting to \$10,250. (A. P. U.)

American Academy of Political and Social Science

continued during 1939 the activities which it has carried on throughout its fifty years of history. Through publications and through meetings it devotes its attention to the discussion of questions of national and world importance. Its annual meeting for 1939 was held on March 31 and April 1 and was the 43rd of such meetings. The subject for the two-day discussion was "Democracy and the Americas." During the fall of 1939 evening sessions were held as follows: on October 14, "American Foreign Policy"; on November 18, "The Roots of Totalitarianism." A luncheon meeting was held also on December 11 on the subject, "America Faces South."

The *Annals*, which is the bi-monthly journal of the Academy and which devotes each issue to a symposium on a designated topic, published its six regular issues during 1939. The titles were: Ownership and Regulation of Public Utilities (January); Appraising the Social Security Program (March); Refugees (May); Democracy and the Americas (July); Frontiers of Legal Aid Work (September); Government Expansion in the Economic Sphere (November). During the year there appeared the third of the monograph series published by the Academy. The title is "The Turkey of Atatürk" and the author is Donald E. Webster.

(E. M. P.)

American Association of University Professors: *see* ACADEMIC FREEDOM; UNIVERSITIES AND COLLEGES.

American Bankers Association. Membership in the American Bankers Association in 1938-39 under the administration of Philip A. Benson, president of The Dime Savings Bank of Brooklyn, New York, reached the greatest percentage since records of the organization have been kept, with approximately 80%, or 13,747 of the banks in the United States belonging.

A new and hitherto unexplored field of banking research was entered by the association in 1939. Studies of the actual volume and number of loans made by banks in various States were undertaken and figures showing the extent to which banks actively serve the credit requirements of their communities were made public. In addition, a compilation was made of specified amounts of credit available at all times to established regular business borrowers.

Officers of the association elected at the annual convention at Seattle, Wash., Sept. 25-28, 1939, for the ensuing year are: president, Robert M. Hanes, Winston-Salem, N. C.; first vice-president, P. D. Houston, Nashville, Tenn.; second vice-president, Henry W. Koeneke, Ponca City, Okla.; treasurer, B. Murray Peyton, Duluth, Minn.; executive manager, Dr. Harold Stonier, New York,

N.Y.; senior deputy manager, Frank W. Simmonds, New York, N.Y.; secretary, Richard W. Hill, New York, N.Y.; national bank division, president, Melvin Rouff, Houston, Texas; vice-president, Andrew Price, Seattle, Wash.; trust division, president, Roland E. Clark, vice-president, Carl W. Fenninger, Philadelphia, Pa.; State bank division, president, William S. Elliott, Canton, Ga.; vice-president, Harry A. Bryant, Parsons, Kan.; savings division, president, A. George Gilman, Malden, Mass.; vice-president, Roy A. Marquardt, Chicago, Ill.; State secretaries section, president, C. C. Wattam, Fargo, N.D.; first vice-president, L. F. Scarboro, Denver, Colo.; second vice-president, Armitt H. Coate, Moorestown, N.J. (L. G.N.)

American Bar Association.

The Civil Rights Committee, under the chairmanship of Grenville Clark, filed a brief as *amicus curiae* in the suit against Mayor Hague and officials of Jersey City, N.J., to enjoin denial of right to distribute printed matter and arbitrary refusal of permits for public meetings. The decision of the U.S. Supreme Court, June 5, 1939, sustained injunction decreed by District Court. *Hague, et al v. C.I.O.*, 307 U.S. 496. The Logan-Walter bill, pending in Congress, was drafted by the Administrative Law Committee, headed by Chairman O. R. McGuire. It would require Federal administrative agencies to formulate rules of civil procedure and provides a uniform method for judicial review of their decisions, with the intent of canalizing administrative discretion within statutory limitations. The committee on Labour, Employment and Social Security, under the chairmanship of William L. Ransom, submitted a detailed study of Federal legislation in its field with recommendations for amendments. Awards: annual Medal of the Association to Major Edgar B. Tolman, editor-in-chief of the *A.B.A. Journal*, for his contributions to law reform; Ross Essay Prize of \$3,000 to Professor Malcolm McDermott of Duke University Law School; Awards of Merit to State Bar of South Dakota and Bar Association of Dallas. Elected at July 1939 meeting: Charles A. Beardsley, president; Thomas B. Gay, chairman of the House of Delegates; Harry S. Knight, secretary; John H. Voorhees, treasurer; Joseph D. Stecher, assistant secretary. (M. D.N.)

American Chemical Society.

The society operates under a National Charter from the 75th Congress. In 1939, the presidency passed from Dean F. C. Whitmore of the Pennsylvania State college to Dr. C. A. Kraus of Brown university, with Dean S. C. Lind of the University of Minnesota as president-elect. He became president Jan. 1, 1940. National meetings in Baltimore and Boston showed attendances of 4,024 and 3,924 with 499 and 547 scientific papers, respectively. The 92 local sections were more active than ever. The awards of the society: to Leroy S. Palmer, the Borden award in the Chemistry of Milk; to George Wald, the Eli Lilly and Company award in Biological Chemistry; to George Hubbard Clapp, the Pittsburgh award; to Raleigh Gilchrist and Edward Wickers, the Hillebrand award; to Joel H. Hildebrand, the Nichols medal; to Charles F. Vaughn, the Schoellkopf medal; to Donald Dexter van Slyke, the Willard Gibbs medal. Membership passed 23,000. (C. L. Ps.)

American Citizens Abroad.

The following is an estimate of the number of American citizens living abroad, as of Jan. 1, 1939, compiled from reports received from American consulates in all parts of the world. This estimate includes only those whose residence abroad has a permanent or semi-permanent character and therefore excludes tourists and all others whose sojourn abroad was considered

to be only transitory. Attention is called to the fact that in spite of the care exercised by consuls in preparing their reports, it was impossible in many cases for them to obtain exact figures as to the number of Americans residing in their respective districts. Nevertheless, this estimate, based on all available sources of information, may be regarded as a fairly accurate world census of Americans living abroad.

SOUTH AMERICA	
Argentina	2,748
Bolivia	422
Brazil	3,812
Chile	1,280
Colombia	2,544
Ecuador	377
Paraguay	69
Peru	1,465
Uruguay	208
Venezuela	2,847
Total	15,772

MEXICO AND CENTRAL AMERICA	
British Honduras . . .	175
Costa Rica	875
El Salvador	271
Guatemala	1,130
Honduras	1,083
Mexico	12,840
Nicaragua	668
Panama	4,464
Total	21,515

WEST INDIES AND BERMUDA	
Bahamas	179
Barbados	284
Bermuda	295
Cuba	5,091
Dominican Republic . .	4,976*
Netherlands West Indies .	1,890
French West Indies . . .	22
Haiti	354
Jamaica	702
Trinidad	384
Total	14,177

CANADA AND NEWFOUNDLAND	
CANADA	175,223
Alberta	28,519
British Columbia . . .	12,261
Manitoba	28,961
New Brunswick	2,416
Nova Scotia	3,766
Ontario	46,584
Quebec	31,958
Saskatchewan	20,758
NEWFOUNDLAND	463
Total	175,686

EUROPE	
Albania	233
Belgium	1,383
Great Britain and Northern Ireland . . .	10,522
Bulgaria	195
Czecho-Slovakia	3,793
Danzig, Free City of . .	28
Denmark	555
Estonia	30
Finland	320
France	12,964
Germany	5,787
Gibraltar	15
Greece	3,014
Hungary	800
Ireland	2,555
Italy	23,330

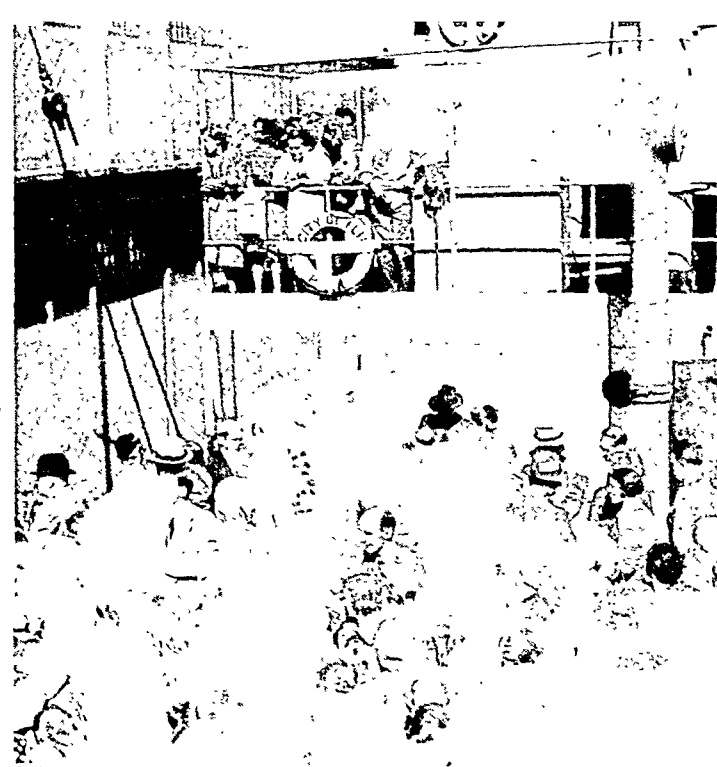
EUROPE—Cont.	
Latvia	147*
Lithuania	239
Luxemburg	48
Malta	74
Netherlands	927
Norway	2,378
Poland	2,569
Portugal	5,127
Lisbon	505
Oporto	447
Madeira	135
Azores	4,040
Rumania	729
Spain and Canary Islands	853†
Sweden	1,693
Switzerland	1,802
Union of Soviet Socialist Republics . . .	400
Yugoslavia	2,093
Total	84,603

AFRICA	
Algeria	61
Belgian Congo	672
Egypt	775
Kenya	427
Liberia	228
Morocco	171
Nigeria	408
Union of South Africa	1,565
Cape Province	393
Natal	209
Transvaal and South Orange	963
Tunisia	90
Total	4,397

ASIA	
Arabia	10
Ceylon	66
China	7,707
Netherlands East Indies . . .	590
French Indo-China . . .	131
Hongkong	1,228
India	3,511
Iran	189
Iraq	352
Japan	6,720
Palestine	9,000
Siam	149
Straits Settlements . . .	613
Syria	1,495
Turkey (Including Turkey in Europe) . .	380
Total	32,051

FIJI ISLANDS	18
SOCIETY ISLANDS	180

AUSTRALASIA	
Australia	2,095
New Zealand	303
Total	2,398
GRAND TOTAL	350,797



MORE THAN 200 AMERICAN and Canadian survivors of the "Athenia" arrived Sept. 13, 1939, at Halifax aboard the American freighter "City of Flint," which was captured as a contraband carrier a month later by the German pocket battleship "Deutschland"

OCCUPATION	
Accountant	774
Actor	620
Architect	116
Artist	1,016
Banker, Broker	1,632
Buyer, Exporter, Importer .	898
Clerk, Secretary	7,486
Contractor	492
Doctor	2,071
Draftsman	263
Druggist	131
Engineer	3,257
Executive	4,515
Farmer-Rancher	1,550
Florist	370
Housewife	19,304
Interior Decorator	173
Labourer (Common)	4,808
Labourer (Skilled)	14,791
Lawyer	1,860
Librarian	202
Manufacturer	1,501
Merchant	3,242
Miscellaneous	4,252
Missionary	1,196

OCCUPATION—Cont.	
Musician	503
None	12,389
Nurse	1,872
Religious	2,604
Restaurateur	1,040
Retired	3,371
Salesman	2,585
Scientific	1,147
Servant	3,041
Student	14,160
Teacher	12,570
Technician	597
Tradesman	1,018
Writer	1,320
Total	134,737

DESTINATION	
Africa	1,958
*All Countries	961
Australia & New Zealand . .	1,730
Eastern Europe	8,158
Far East	4,304
Latin America	10,386
Near East	7,821
Western Europe	110,572

* While a great many applicants inserted "All Countries" in the space provided in applications for destination, it is the opinion of the Department of State that practically all who gave "All Countries" as their destination contemplated visiting Western Europe.

A TYPICAL SCENE—aboard the American liner "Manhattan" Sept. 7, 1939—as returning U. S. citizens accepted any kind of accommodation in their haste to leave war zones



*1938 estimate.
†1938 estimate. Not to be taken as the actual number of American citizens residing in Spain.

The following summary report covering persons procuring passports and renewals during the calendar year which ended Dec. 31, 1938, is based upon actual count compiled from individual passport and renewal applications filed during that year and not computed as heretofore from a cross-sectional study. This 1938 summary report is therefore not comparable with reports for previous years:

OBJECT OF TRAVEL

Commercial	6,030
Education	7,754
Employment	5,591
Family Affairs	3,608
Health	1,232
Personal Business	39,164
Professional	2,870
Religious	2,053
Scientific	280
Travel	66,144
Miscellaneous	11

APPLICANT

Native	83,267
Naturalized	51,470
Male	71,385
Female	63,352

ADDITIONAL PERSONS INCLUDED IN PASSPORTS

Adults	14,850
Minors	14,946

PREVIOUS PASSPORTS

Number having been previously issued American passports	46,501
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PERMANENT RESIDENCE 1938

	Number Receiving Passports or Renewals of Total	Percent
Alabama	367	0.27
Alaska	63	0.05
Arizona	304	0.23
Arkansas	171	0.13
California	11,839	8.79
Colorado	793	0.59
Connecticut	3,853	2.86
Delaware	344	0.26
Dist. of Columbia	1,898	1.41
Florida	1,217	0.90
Georgia	587	0.43
Idaho	190	0.14

* Exclusive of New York City.

PERMANENT RESIDENCE 1938

	Number Receiving Passports or Renewals of Total	Percent
Illinois	10,233	7.59
Indiana	1,558	1.15
Iowa	934	0.69
Kansas	551	0.41
Kentucky	504	0.37
Louisiana	871	0.65
Maine	538	0.40
Maryland	1,640	1.22
Massachusetts	9,051	6.72
Michigan	4,418	3.28
Minnesota	1,096	1.26
Mississippi	235	0.17
Missouri	1,700	1.26
Montana	291	0.22
Nebraska	574	0.43
Nevada	130	0.10
New Hampshire	488	0.36
New Jersey	9,283	6.89
New Mexico	145	0.11
New York city	31,090	23.07
*New York State	9,123	6.77
North Carolina	590	0.44
North Dakota	131	0.10
Ohio	5,680	4.22
Oklahoma	741	0.55
Oregon	567	0.42
Pennsylvania	10,017	7.43
Rhode Island	1,195	0.89
South Carolina	325	0.24
South Dakota	124	0.09
Tennessee	540	0.40
Texas	2,534	1.88
Utah	549	0.41
Vermont	262	0.19
Virginia	999	0.74
Washington	1,338	0.99
West Virginia	464	0.34
Wisconsin	1,857	1.38
Wyoming	145	0.11
	134,737	100.00

134,737 100.00

The United States maintains the following diplomatic and consular offices abroad: 20 embassies (5 perform diplomatic as well as consular duties); 36 legations (20 perform diplomatic as well as consular duties); 55 consulates general; 171 consulates; 3 vice consulates.

(R. B. S.)

American College of Surgeons, founded in 1913 by 500 surgeons of the United States and Canada, under the leadership of the late Dr. Franklin H. Martin, to insure a standard of professional, ethical, and moral requirements for every graduate in medicine who practices general surgery or any of its specialties. Fellowship, 1940: 12,793. Chairman, board of regents, Dr. Irvin Abell, Louisville, Ky.; president, 1939-40, Dr. George P. Muller, Philadelphia, Pa.; president-elect, Dr. Everts A. Graham, St. Louis, Mo.; secretary, Dr. Frederic A. Besley, Waukegan, Ill.; associate director and chairman, administrative board, Dr. Malcolm T. MacEachern, Chicago, Ill.; associate director, Dr. Bowman C. Crowell, Chicago, Ill.; assistant directors, Dr. E. W. Williamson and Dr. Harold Earnhart, Chicago, Ill. The organization originated Hospital Standardization Movement, 1918, formulating minimum standards for approval and starting periodic surveys; 2,720 hospitals in United States, Canada, and other countries are on 1939 approved list; 307 cancer clinics in hospitals were approved in 1939; and 933 medical services in industry were approved in 1939. An approved list of medical motion picture films is also issued yearly. The college maintains a medical library and literary research department. The committee on graduate training for surgery (general surgery and the surgical specialties) was organized in 1937. Committees on cancer, archives of cancer, bone sarcoma, fractures and other traumas, and the Hall of the Art and Science of Surgery, function through a department of clinical research. Sectional

meetings were held in 1939 in Nashville, Tenn.; Baltimore, Md.; Indianapolis, Ind.; and Winnipeg, Man. The 29th Annual Clinical Congress and the 22nd Annual Hospital Standardization Conference, attended by 3,000 surgeons and 1,500 hospital executives, were conducted by the College in Oct. 1939, in Philadelphia, U.S.A. (M. T. M.)

American Council on Education: see EDUCATION.

American Dental Association: see DENTISTRY.

American Economic Association. The purpose of the American Economic Association (founded in 1885) is to encourage economic research, issue publications on economic subjects, and stimulate thought and discussion of current problems from an economic point of view. The articles appearing in the association's quarterly publication, the *American Economic Review*, and the papers included in the *Proceedings* of the 52nd Annual Meeting, held in Philadelphia, Dec. 1939, fairly reflect the character of problems currently treated by economists and are indicative of the progress of economic thought of the year.

Officers for the year 1940 are: president, Frederick C. Mills, Columbia university; vice-presidents, James W. Angell, Columbia university; Calvin B. Hoover, Duke university; secretary-treasurer, James Washington Bell, Northwestern university; elected members of the executive committee, Benjamin M. Anderson, Jr., University of California at Los Angeles; Mabel Newcomer, Vassar college; Paul T. Homan, Cornell university; Ray B. Westerfield, Yale university; J. Douglas Brown, Princeton university; George W. Stocking, University of Texas.

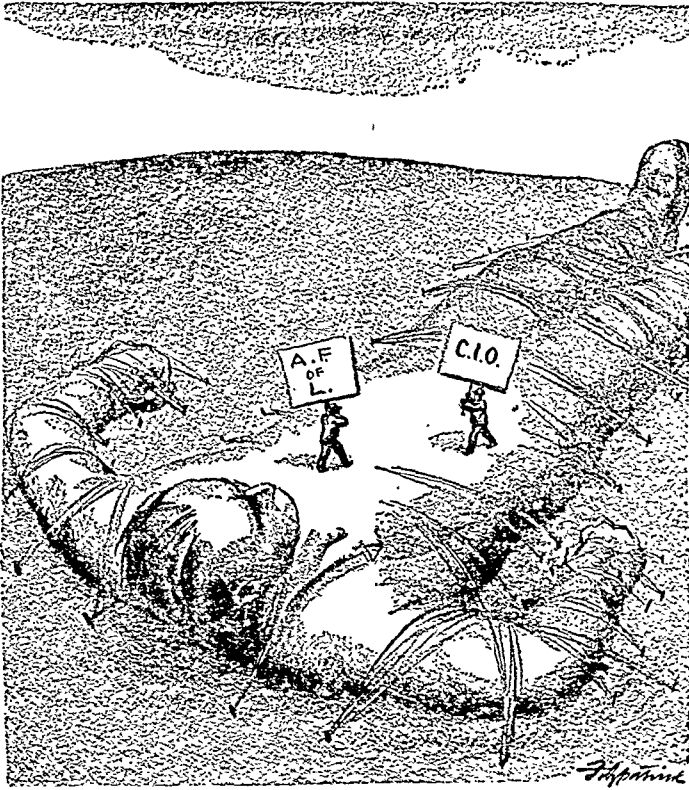
Membership, as listed in the handbook of the association, numbering approximately 3,000 (an additional 1,300 libraries and other subscribers are not included), constitutes a veritable "who's who" of American economists.

American Ethnology, Bureau of: see SMITHSONIAN INSTITUTION.

American Federation of Labor was formed at a convention in Columbus, Ohio, in 1881 by a small group of craft union leaders headed by Samuel Gompers, English-born cigarmaker. Gompers was elected president and was re-elected each year except 1893 until he died in 1924.

The American Federation of Labor in 1920 reported a dues-paying membership of 4,078,740. In 1933 its membership dropped to 2,126,796. On Aug. 31, 1939, the Federation consisted of 105 national and international unions; 1,568 local labour unions in the U.S. and Canada; 49 State federations; and 806 city central bodies, with a membership of 4,006,354. It lost a membership of approximately 1,000,000 in 1936 when it suspended the Committee for Industrial Organization unions, but during the following years the Federation redoubled its organization efforts and regained in new members the C.I.O. loss. The president of the American Federation of Labor is William Green, a former coal miner and former official of the United Mine Workers of America. He was elected president Dec. 19, 1924.

The Federation has a threefold purpose: (1) to organize unorganized workers; (2) to promote the interests of its members through legislative activity and publicity; and (3) to settle disputes among its members. The Federation's annual autumn convention is its final seat of authority. Between conventions the Federation is governed by an executive council made up of the president, secretary-treasurer, and fifteen vice-presidents. It is financed by a per capita tax on member unions, two cents each month for



U. S. LABOUR was a modern Gulliver in 1939, according to Fitzpatrick of *The St. Louis Post-Dispatch*

each member of national and international unions and 35 cents a month for each member of directly affiliated local unions. The financial report of the Federation beginning Sept. 1, 1938, and ending Aug. 31, 1939, showed that the balance on hand, Aug. 31, 1938, was \$443,631.19; the total receipts for the twelve months ending Aug. 31, 1939, were \$1,800,249.70 and the total expenses for the same period were \$1,697,376.53, leaving a balance on hand Aug. 31, 1939, of \$546,504.36. (See also CONGRESS OF INDUSTRIAL ORGANIZATIONS; LABOUR UNIONS; STRIKES AND LOCK-OUTS; UNITED STATES: History.) (L. STA.)

American Federation of Teachers: see EDUCATION: *Institutes on Professional Relations.*

American Geographical Society. Two expeditions involving mountaineering and aerial photography for mapping purposes were carried out under the sponsorship of the American Geographical Society in 1939. On the Cabot Colombian Expedition extensive field studies in geology and physiography were made in the Sierra de Santa Marta in northern Colombia, the highest peak (18,770ft.) climbed, and the Sierra mapped by aerial photography. On the Third Wood Yukon Expedition the ground-control work of the two previous expeditions of 1935 and 1937 was linked and further aerial photography carried out. Topographic maps will be constructed from the aerial photographs taken on these expeditions by a special method of mapping from high-oblique photographs developed at the society. Awards of the society's gold medals for 1939 were: the Cullum Geographical medal to Emmanuel de Martonne, professor of geography at the University of Paris and president of the International Geographical Union; the Charles P. Daly medal to Herbert J. Fleure, professor of geography at the University of Manchester; and the David Livingstone Centenary medal to John P. Rymill, leader of the British Graham Land Expedition of 1935-37.

The society's publications during 1939 included an addition to its Special Publications series of monographs entitled "White Settlers in the Tropics" (a study of the possibilities of permanent settlement by white men in the tropics, by A. Grenfell Price, an Australian geographer and master of St. Mark's college, University of Adelaide) and a series of maps of Europe on a single sheet designed for reference purposes and for use in following present military operations in Europe, entitled "Environment and Conflict in Europe: Eighteen Basic Maps."

The periodical publications of the society, the *Geographical Review*, its quarterly journal, and *Current Geographical Publications*, a classified list, issued monthly except for July and August, in mimeographed form, of the titles, with the usual catalogue information, of books, articles, and maps selected for inclusion in the society's Research Catalogue, were continued during the year. (R. R. P.)

American Historical Association was incorporated by act of Congress in 1889 "for the promotion of historical studies . . . and for kindred purposes in the interests of American history and of history in America." It had (Jan. 1, 1940), a membership of about 3,500, chiefly recruited from the teachers and writers of history in American and Canadian schools and colleges. Its national headquarters are at 740 15th Street, N.W., Washington, D.C., but its chief administrative officer, the executive secretary, has offices at 226 South 16th street, Philadelphia, Pennsylvania. It is governed by a Council elected at the annual meeting and supported by annual dues (\$5) and by the income of an endowment fund of about \$250,000.

Its officers for the year 1940 are: president, Max Farrand, Huntington library; first vice-president, James Westfall Thompson, professor emeritus of the University of California; second vice-president, Arthur M. Schlesinger, Harvard university; treasurer, Solon J. Buck, the National Archives; executive secretary, Conyers Read, University of Pennsylvania.

During the year 1939 it continued the publication of *The American Historical Review*, the leading historical journal in America, and participated in the publication of *Social Education*, devoted to the problem of teaching the social studies in the school. It also published in 1939 *The Course of the South to Secession*, by Ulrich B. Phillips, edited by E. Merton Coulter; *James Kent, A Study in Conservatism*, by John T. Horton; *John Tyler, Champion of the Old South*, by O. P. Chitwood; *Writings on American History* for the year 1935; and *Proceedings* for 1937; the two latter printed by the United States Government. (C. Rd.)

American Indians: see INDIANS, AMERICAN.

American Law Institute. Since its organization, the chief work of the American Law Institute has been a *Restatement of the Law*, best described as an orderly statement of the present common law. While the sections into which the Restatement is divided are written in statutory form, they are not presented to legislatures for adoption. The object of the Restatement is to clarify and simplify the common law, but not to prevent its continued development by judicial decision. Prior to 1939, 13 volumes of the Restatement were published, including the Law of Contracts, Conflict of Laws, Agency, Trusts, and Restitution, besides large portions of the Law of Property and Torts. During the year, the fourth and final volume on Torts has been completed and published, while work on the Restatement of Property and Security has been continued. In 1939 two other projects of importance have been begun—the drafting of a model Code of Evidence and a statute or statutes dealing with

the administration of the criminal law in so far as it affects youths between 16 and 21 convicted of crime.

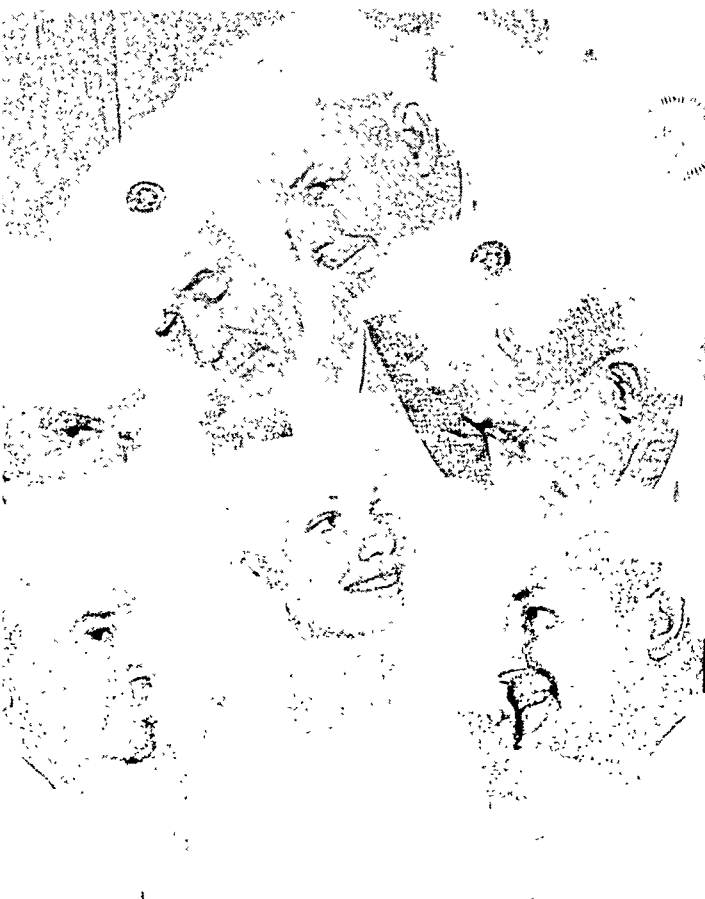
Part of this last work, relating to a treatment board to which such convicted youths will be sentenced, has been completed by the editorial staff, approved by the Council and is ready for submission to a meeting of the Institute.

The American Law Institute was organized in Feb. 1923. Its object is to carry on constructive scientific work for the improvement of the law. Aside from the official members, who are those holding the leading judicial, bar, and law school faculty positions, there are 719 life members; membership being a distinct professional honour. The governing body is a Council of 33. The members meet each year in Washington, D.C. All legal and other official publications of the Institute must be first approved by the Council and by a meeting of members. The president is George Wharton Pepper; William Draper Lewis is director and chief of the editorial staff. The executive office is at 3400 Chestnut street, Philadelphia, Pennsylvania. (W. D. L.)

American Legion.

In 1939 the militant program to "pre-serve America for Americans" witnessed a record-breaking progress toward the Legion's 20-year objective of an adequate national defence, a wide extension of Americanism, youth-training activities, and strong support for the Dies Congressional Committee investigating subversive activities, and successful pressure to bring about the deportation trial of Harry Bridges, West Coast alien agitator; child welfare, with the long-range program, continued seeking liberalized benefits for needy children in the State social security programs, while the immediate program again was devoted to extending emergency financial aid from Legion and other sources amounting to

ANN SHERIDAN, movie actress, was a welcome "mascot" Sept. 26, 1939, at the American Legion's convention in Chicago



\$3,757,865.27 for 442,489 needy children; a rehabilitation program recovered grants totalling \$3,338,857.50 in contested benefits for disabled veterans and their dependents; membership for the third consecutive year was the second best in the history of the American Legion and its four affiliated organizations.

The 21st annual national convention was attended by 250,000 members and their families in Chicago, Sept. 25 to 28, 1939.

From resolutions adopted by the Chicago convention, the national executive committee, at Indianapolis, November 23 and 24, selected the following major national legislative program:

(1) Government protection of World War widows and orphans, (2) an adequate national defence, (3) continued advocacy of universal service legislation as a measure to promote defence and deproftize war, (4) effective veterans' preference in all Government jobs, (5) further tightening of immigration, naturalization, and deportation laws.

The 1,405 official delegates, representing 58 continental and outlying departments, and six posts not attached to any department, named Raymond J. Kelly, Detroit, Mich., corporation counsel to succeed Stephen F. Chadwick, Seattle, Wash., as national commander, and chose Boston, Mass., as the 1940 convention city.

National headquarters of the American Legion, and of its affiliated organizations, the American Legion Auxiliary, the Forty and Eight, and the Sons of the American Legion, remained at the War Memorial building, Indianapolis. The Eight and Forty has headquarters elsewhere in Indianapolis. Frank E. Samuel, national adjutant, and principal administrative officer of the American Legion, was re-elected by the national executive committee at its November meeting in Indianapolis.

(R. J. K.)

American Library Association,

the official organiza-

tion of librarians in the United States and Canada, consists of librarians, library trustees, and others interested in libraries. Founded in 1876, it functions through a headquarters staff of over 65 persons and through 75 voluntary boards and committees. International in character from its beginning, the association had representatives from every major country in its 1939 membership which numbered over 15,000.

The oldest and largest association of its kind, it is affiliated, formally or informally, with more than fifty other library associations in America and abroad.

One of the chief objectives of the association is complete and adequate library coverage for the United States and Canada. In 1939 approximately 42,000,000 people in the United States—92% of them in rural areas—were without access to a public library. Other objectives are: "to assist libraries to operate with the utmost economy and efficiency; to improve the status of librarianship; to build for the future of library service by drawing into the profession some of the best qualified young men and women; and to promote studies which will tend to establish on a solid foundation the library's place in the governmental and social structure."

Standards of training for librarians are set by the association and a free employment service is offered to libraries and individual librarians. The total income for the fiscal year was about \$350,000. The association's endowment is (Jan. 1, 1940) approximately \$2,179,000.

The association issues four periodicals: *A.L.A. Bulletin*, a monthly which includes the annual reports, the conference proceedings, and the yearly handbook; the *Booklist*, published semi-monthly as a guide to the selection and purchase of current books; the *Subscription Books Bulletin*, a quarterly which presents critical estimates of subscription books and sets sold currently by canvassing agents and the *Journal of Documentary Reproduction*, a

quarterly. In addition, the association published 28 other professional books and pamphlets during the year, a few outstanding titles including *American Librarianship from a European Angle*, by Wilhelm Munthe; *Personnel Administration in Public Libraries*, by Clara W. Herbert; *Helping Adults to Learn*, edited by John Chancellor; *Helping the Reader toward Self-Education*, by Chancellor, Tompkins, and Medway; *Books for Self-Education*, by Sigrid Edge; *College and University Library Service*, by A. F. Kuhlman; and *Vitalizing a College Library*, by B. Lamar Johnson.

During the association's 61st annual conference, held in San Francisco, June 18-24, and attended by approximately 3,000 persons, four awards were made. The Joseph W. Lippincott award was presented to Herbert Putnam, former librarian of Congress, for the most outstanding contribution to librarianship last year; the James Terry White medal, to Louis Round Wilson, dean of the Graduate Library School of the University of Chicago for his *Geography of Reading*; the Caldecott medal, to Thomas Handforth for his illustrations in *Mei Li*, cited as the most distinguished American picture book for children published in 1938; and the Newbery medal, to Elizabeth Enright, for her *Thimble Summer*, considered the most distinguished contribution to children's literature published during 1938. Dr. John H. Finley, editor emeritus of *The New York Times* was made an honorary member of the association. The 1940 conference will be held in Cincinnati, Ohio, May 26-June 1.

Among library developments of the year for which the A.L.A. worked were Federal aid for libraries, embodied in the Harrison-Thomas bill introduced in both Houses during the 76th Congress but not acted upon at the first session; State and provincial aid, granted in small amounts for public libraries in British Columbia, Nova Scotia, Arkansas, Ohio, and Vermont; more effective library co-operation between the libraries of North America and Latin America, A.L.A. efforts being furthered by a grant of \$30,000 from the Rockefeller Foundation; and closer sympathy and understanding between European and American peoples, through gifts of books to a selected group of popular libraries in Europe, the gifts being made possible by a \$60,000 Rockefeller Foundation grant. The A.L.A. issued three important official pronouncements during the year; the revised *National Plan for Libraries*, the new *Code of Ethics*, and the *Library's Bill of Rights*. The A.L.A. Council also adopted *Classification and Pay Plans for Municipal Public Libraries*, prepared by the A.L.A. Board on Salaries, Staff, and Tenure. A generous grant from the Rockefeller Foundation has assured completion of the new edition of the *Union List of Serials*.

The association was represented at the International Library Committee meeting at The Hague and at Amsterdam in July 1939, by Harrison W. Craver and J. Periam Danton; at the International Conference on Documentation in Zurich in August by Vernon Tate and Arthur B. Berthold; and at the meeting of the Library Association of Great Britain in Liverpool in June by Gerhard R. Lomer and Charles R. Sanderson.

Ralph Munn, Pittsburgh, Pa., is the association's 1939-40 president. Carl H. Milam is executive secretary of the A.L.A. headquarters, located at 520 North Michigan avenue, Chicago. (See also LIBRARIES.) (B. S. RL.)

American Literature. In 1939, both fiction and non-fiction held steadily to the principal discernible trend of the past few years, namely, an interest in the nation's past. Historical novels dominated the scene, and the great figures of other years, Lincoln, Thoreau, Marshall and Taney, Hamilton, and Emerson provided subject matter for the outstanding biographies or collections of letters.

The trend was further strengthened by numerous historical

volumes, designed to make their readers familiar with the ideals of the earlier days of the Republic. Because of the outbreak of the war in Europe there were also many books on international affairs, and fresh treatment of the relation of the United States to the conflict between democratic and totalitarian ideals raging abroad.

The most popular and at the same time controversial novel of the twelvemonth was John Steinbeck's *The Grapes of Wrath*, a dramatic and arousing treatment of the problem of migratory workers seeking their fortunes in California after their eviction from the Oklahoma dust-bowl. Coming close on the heels of the success of Mr. Steinbeck's novelette, *Of Mice and Men*, the novel was bound to attract critical attention and was hailed by the majority of reviewers as a major work. Californians denied the truth of the presentation, and the quarrel inevitably attracted more readers. The same problem was treated by Carey McWilliams in a non-fiction study, *Factories in the Fields*, which seemed to bear out Mr. Steinbeck's conclusions of serious social injustices in the Salinas valley.

Reviewers less impressed by Mr. Steinbeck's proletarian sympathies and by his unquestioned skill as a writer of fiction, found artistic flaws in *The Grapes of Wrath* and were unwilling to concede it a place among the nation's masterpieces, the principal criticism being aimed at the ending of the book, which appeared to leave the questions raised without a specific solution. Others found Mr. Steinbeck's Biblical and prophetic passages hollow rather than masterful, but the novel swept the country and was widely read even by people who were offended at the frankness of its language.

Its popularity, coming at the end of the so-called proletarian movement in the nation's fiction, which was dying even before the Hitler-Stalin pact, was a tribute to the growing reputation of its author, and to his ability to make appealing figures of his characters. The bold prophecy that it would prove the *Uncle Tom's Cabin* of the times seemed hardly to be justified as the year ended, with the story on its way to the screen by way of Hollywood, but there is no doubt that it did arouse wide interest in a local problem, and widespread sympathy with one section of the underprivileged, although specific action did not seem to follow the wave of emotion caused by the book.

While no other novel of the year equalled the Steinbeck opus in sales, Christopher Morley's story of a working-girl, *Kitty Foyle*, appeared to be a serious rival as the year ended, and was obviously destined to be the most popular work of fiction of this prolific writer. In contrast to the proletarian material of Mr. Steinbeck, Mr. Morley went to the great middle-classes for his study of a typical American girl, and with great warmth and sympathy, presented her as a young person of character, facing her problems with courage and good sense.

Among books of non-fiction, none received such high praise as Carl Sandburg's continuation of his monumental life of Abraham Lincoln, *The War Years*, a four-volume work which was universally praised as a folk-story of first importance, in addition to being an important section of what promised to be the definitive study of a great man. Henry Seidel Canby's *Thoreau* was also widely hailed as the kind of biography the Sage of Concord had long deserved, and like the Sandburg *Lincoln*, a book with its abundance of lessons for present-day Americans, a ripely scholarly achievement.

The most popular book of non-fiction of the year, however, illustrated once more the depth and strength of this country's interest in its small-town past. It was Bellamy Partridge's *Country Lawyer*, the story of the author's father's career in a little up-state New York town. Mr. Partridge had been long known as editor, reviewer, and author of light-fiction, but was to find his

notable success in dealing with intimate family material, which he handled with humour and sympathy, and which obviously touched the hearts of a great public.

The year in poetry found no conspicuously successful volume and brought forth no especially promising new voices. Edna St. Vincent Millay's *Huntsman, What Quarry?*, did little to enhance its author's standing, especially following so close upon *Conversation at Midnight*, regarded askance by most reviewers. Robert P. Tristram Coffin's *Collected Poems* helped to establish Mr. Coffin's place as the voice of conventional New England, while a similar volume of William Carlos Williams formed an interesting contrast because of its originality, often bordering upon obscurity. Less was heard from the Left Wing, although Archibald MacLeish, Muriel Rukeyser, and others continued their appeals in verse for a greater measure of social justice and a curbing of the evils which they regarded as besetting the existing American system.

Novels.—Aside from the popular successes of Messrs. Steinbeck and Morley, the most solid accomplishment in the field of historical fiction was Elizabeth Page's *Tree of Liberty*, a long novel dealing with the early days of the nation, using characters from life with freedom and impressive skill, and telling a story with its full significance for our own times. The work of five years of research, Miss Page's book scored not only by its authenticity and its wide-ranging knowledge, but by the novelist's ability to make her people live and to fill her pages with exciting incidents.

Other historical novels of importance included Chard Powers Smith's *Artillery of Time*, another long book about a New York State family, marred by some artistic faults, but covering successfully a wide span of time, and well enough written to be easily and pleasurably read; Vardis Fisher's *Children of God*, a saga of the Mormons, and the most extensive fiction treatment of this curious chapter in U.S. history; Francis Griswold's *Sea Island Lady*, a story of a Northern woman in South Carolina during the days of the Civil War and after, by the author of *The Tides of Malvern*; and Bruce Lancaster's *Guns of Burgoyne*, the last mentioned one of a number of novels dealing with the Revolutionary period. Others in the group were Frank O. Hough's thoughtfully realistic story of Westchester county, *If Not Victory*; John Jennings's *Next to Valour*; Leland D. Baldwin's *The Delectable Country*, a novel of Ohio in the late years of the 18th century, and one of the best of its kind; and Mary Schumann's *Strife Before Dawn*, which dealt with Pontiac's War, 1764-1782.

Clifford Dowdey went to Colonial Virginia for his *Gamble's Hundred*, a romance with social connotations, the struggle between the great planters and the small farmers; Clyde Brion Davis dropped his familiar subject of the pathos of small lives and wrote a vigorous and entertaining frontier story, *Nebraska Coast*, and Holmes Alexander went back to the early days of West Virginia for his *American Nabob*, less successful as a novel than as a document.

Well-known novelists working inside and outside the historical field who appeared on the year's lists included James Boyd, whose *Bitter Creek* was one of his lesser works because of its resemblance to the conventional "Western," in spite of the unflinching talent of its author for good fiction; John P. Marquand, whose *Wickford Point* was the delightfully told story of a decadent and amusing New England family, and one of the year's most popular novels; William Faulkner, whose *Wild Palms* was an only partly successful attempt to fuse symbolically two separate stories, one of which described a convict's struggles during a Mississippi river flood with striking success, while the other, a conventional tale of passion, failed to come off; and John Dos Passos, whose *Adventures of a Young Man* was its author's confession of his failure to find perfection among the Left Wing saviours of mankind, at best



After a portrait by Bo Beskov

JOHN STEINBECK, author of *The Grapes of Wrath*

one of his minor productions. Pearl S. Buck returned to the East for the material of her *The Patriot*, a timely story of Japan and China, and wrote one of her best books after the lamentable failure of *This Proud Heart*, and Frederic Prokosch proved his right to a place among the best of the younger novelists with his *Night of the Poor*, his first novel of the American scene.

The loss to our literature in the death of Thomas Wolfe was brought freshly to mind by the publication of the first of his posthumous works, *The Web and the Rock*, which proved to be of a piece with his scattered and confused earlier novels, but which illustrated again his great powers of poetry and characterization, hardly equalled in his time. Another novel, *You Can't Go Home Again* is to follow, before the final contribution of this distinguished figure can be assayed; there was also published during the year *The Face of the Nation*, poetical passages from Wolfe's earlier works, which strengthened his claim to a place beside Walt Whitman in his feeling for America and his ability to express his rhapsodies in prose often of great power and beauty, and often, unfortunately, hollowly rhetorical.

Among the better novels by newcomers were Augusta Tucker's *Miss Susie Slagle's*, a fine human story of a spinster in Baltimore and her relations with Johns Hopkins medical students; Robert Penn Warren's powerful tale of the tobacco wars in Kentucky, *Night Rider*; Kenneth Fearing's *Hospital*, the first venture into fiction by a good poet; Elizabeth Marion's *The Day Will Come*, a remarkably mature study in family relationships by a young woman of only 22 years; and Beatrice Kelly Harris's *Purslane*, a story of every-day middle class North Carolinians with a distinctly native flavour, which found large numbers of readers.

Biography.—In addition to the Sandburg *Lincoln*, the outstanding biography of the year, and to Dr. Canby's *Thorau*, Henry F. Pringle wrote a detailed and sympathetic account of

The Life and Times of William Howard Taft; John Bakeless a readable and accurate study of *Daniel Boone*, and David Loth again studied *Alexander Hamilton*, his sub-title being "The Portrait of a Prodigy." In verse, Robin Lamson told of the achievements of Gorgas, in *Death Closes a Pair of Wings*, while three biographies of living Americans of high quality were Alfred Lief's *Democracy's Norris*, Rixie Smith and Norman Beasley's *Carter Glass*, and George Soule's *Sidney Hillman: Labor Statesman*. Some lesser known Americans who found portraitists during the year included William Henry Harrison, treated in *Old Tippecanoe* by Freeman Cleaves; John Tyler, described by Oliver Perry Chitwood as *John Tyler, Champion of the Old South*, and James Kent, the Federalist Chancellor of New York State, famous for his *Commentaries*, whose life by John Theodore Horton is titled *James Kent, A Study in Conservatism, 1763-1847*.

Other notable biographies which either broke new ground in their approach to well-known figures or re-assayed their subjects were Alphonse B. Miller's *Thaddeus Stevens*, a fair and complete study of the man responsible for Reconstruction; Allan Nevins's *Fremont: Pathfinder of the West*, and *Marshall and Taney* by Ben W. Palmer, notable for its re-evaluation of Taney, and giving in detail the profound effect these two famous jurists had on shaping the Constitution.

A number of autobiographies of lasting importance appeared during the year, the most popular of them William Lyon Phelps's *Autobiography With Letters*, a long and leisurely book filled with the genial quality that has made its author one of the most loved of all the living bookmen; Ida M. Tarbell's *All in the Day's Work*, the reminiscences of an octogenarian journalist still as alert and vigorous as ever; Daniel Beard's *Hardly a Man is Still Alive*, the life-story of the great Boy Scout leader and naturalist; Hutchins Hapgood's *A Victorian in the Modern World*, Flora Finch Kelly's *The Flowing Stream*, Edna Ferber's *A Peculiar Treasure*, Louis Untermeyer's and Leonard Bacon's *Semi-Centennial: Some of the Life and Part of the Opinions of Leonard Bacon*, controversial, intelligent, and highly readable comment on many matters, also *Art Young, His Life and Times*, edited by John Nicholas Beffel, with many of this beloved artist's own illustrations.

The year also saw the publication of Ralph Waldo Emerson's letters in a handsome four-volume edition, edited by Ralph Leslie Rusk, and of Gouverneur Morris's *A Diary of the French Revolution*, which under the careful editing of Beatrix Cary Davenport became one of the most widely read of Revolutionary documents, throwing new light upon a controversial figure from his own materials. Volume I of Josephus Daniels's *A Tar Heel Editor* was an important contribution to Americana, as well as an engaging picture of a man of our own times, and Edith Bolling Wilson's *My Memoir* gave an intimate picture of Woodrow Wilson from the point of view of his second wife, filled with feminine frankness on many matters and on many prominent men and women in public life.

History.—Two of the most distinguished historians of the day collaborated on *The Heritage of America*, Henry Steele Commager and Allan Nevins, a collection of original documents making plain what America is about. An excellent piece of editorial selection, it was as readable as significant and a permanent contribution to the subject. Marjorie Barstow Greenbie wrote a companion volume of value, *American Saga: The History and Literature of the American Dream of a Better Life*, and in *The Living Tradition: Change and America*, Simeon Strunsky surveyed the whole American story with common sense, balance, and humour, finding that there had been far less of change than most people imagined. Foreign-born himself, but illustrating many of the best native virtues, Mr. Strunsky's picture is one to reassure the frightened and to put heart into those who still believe that the U. S. is a good coun-

try in which the free and the well-meaning may live and flourish. It is a long book, 260,000 words, but a most readable and optimistic one. Another event of importance in the field of history was the publication of a 50th anniversary edition of James Bryce's *American Commonwealth*, edited by Robert C. Brooks, and containing a number of noted reviews, such as those of Woodrow Wilson and Lord Acton.

Gerald Johnson's *America's Silver Age* was a lively study of the statesmanship of the Clay-Webster period, and Burton J. Hendrick's *Statesmen of the Lost Cause*, the first detailed study of the men with whom Jefferson Davis surrounded himself as President of the Confederacy. Mr. Hendrick had very little opinion of the Davis aides, but acknowledged the difficulties under which the Southern leader laboured in trying to please the States that made up his loosely organized Government. Captain W. D. Puleston's *Mahan* was a full length biography of the American naval officer whose theory of sea-power has influenced the course of world events, and formed an interesting companion volume to Harold and Margaret Sprout's *The Rise of American Naval Power*, both timely volumes in connection with the prevailing international situation. Tyler Bennett's *Lincoln and the Civil War* was received as a contribution to the Lincoln story of lasting value, and the third volume of Charles A. and Mary Beard's *America in Mid-Passage* was the most important study of recent times in the United States, although not up to the quality of the first two monumental volumes. In their effort to cover the literature of the period, the Beards proved themselves often inaccurate, and their insistence upon measuring fiction by its social content alone weakened what was a significant treatment of recent times, from a Left liberal point of view. Samuel Hopkins Adams retold the Harding story in *Incredible Era*, omitting none of its amazing details. Gustavus Myers added a last chapter to his classic, *The History of Great American Fortunes with The Ending of American Hereditary Fortunes*.

The perpetual fascination of the frontier was exhibited in many books dealing with old days in the West, some of the best of them being Stanley Vestal's *The Old Santa Fe Trail*; Paul Wellman's *The Trampling Herd*; Thomas D. Clark's *The Rampaging Frontier; We Pointed Them North: The Record of a Cowpuncher*, by E. C. Abbott (Teddy Blue) and Helena Huntington Smith, and *The Lion of the Vigilantes and the Life of Old San Francisco* by James A. B. Scherer. In *The Changing West*, William Allen White, beloved editor of the Emporia (Kansas) *Gazette*, gave a realistic and human picture of his part of the country, which while altogether honest, was hopeful. Covering the entire country and devoting ample space, of course, to the West, Edwin F. Embree, in his *Indians of the Americas* wrote of the 20,000 years of the aborigines who preceded white civilization on two continents.

A book of observations of contemporary life in America that seemed to be of more than passing value was Rollo Walter Brown's *I Travel by Train*, friendly and discerning observations of an itinerant college professor. Other volumes bearing upon current problems were Raymond Moley's *After Seven Years*, a frank criticism of the New Deal from the inside; Ralph L. Woods's *America Reborn: A Plan for Decentralization*; Felix Frankfurter's *Law and Politics*; the *Occasional Papers from 1913 to 1918*, edited by Archibald MacLeish and E. F. Prichard, with a foreword by Mr. MacLeish; and Josephine Baker's *Fighting for Life*, the whole story of the battle for child welfare in the U. S., told by one of the principal participants.

In the field of art, several notable books appeared, among the best of them James Flexner's *America's Old Masters*, which told the story of the lives and works of West, Copley, Peale, and Stuart. William Shack's *And He Sat Among the Ashes* gave a full account of the struggles of Louis Eilshemius, an eccentric genius who

Urgel. Its chief products are oats, barley, vines, tobacco, sheep, iron and lead. A good road provides a link with Spain.

Area, 191 sq.mi.; pop. 5,230; capital town, Andorra le Vieja; language, Catalan; religion, Christian (Roman Catholic); imports from United Kingdom: (1936) £1,000; (1937) £63; (1938) £28; currency: French and Spanish legal tender.

Angling. The outstanding catch of the 1939 salt-water season was a new world's record blue marlin which was caught by Mrs. Mary Sears at Cat Cay in the Bahamas. Her giant marlin, caught on June 6, weighed 730 pounds. This exceeded the former blue marlin record, held by Thomas Shevlin, by almost 100 pounds.

The giant bluefin tuna world's record was broken twice in 1939. An 868-lb. record-breaker was caught by J. Frank Johnson on August 30 at Liverpool, Nova Scotia. Less than a month later, on September 24, this record was broken by an 890-lb. bluefin tuna caught at Yarmouth, Nova Scotia. The latter fish, which holds the present world's record, was caught by John Manning of Los Angeles, California.

Many of the giant sharks are getting more and more recognition by the leading salt-water fishermen. Australia, which seems to afford some of the very best shark fishing, produced two new world's records during the 1939 season. One of these was a 1,382-lb. tiger shark caught by Lyle Bagnard at Sydney Head, Australia. The other was a 1,384-lb. white shark landed by G. R. Cowell at Port Lincoln, Australia. Mr. Cowell exceeded his own white shark record by almost 100 lb., and at the same time established a record for the largest fish ever taken on rod and reel.

Only one new world's record was established in the fresh-water fishing field in 1939, but the old record was broken twice. A 59½-lb. muskellunge caught in July in Wisconsin set a new record, but this was surpassed on October 3 when a 60-pounder was caught by John J. Coleman at Eagle River, Ontario. This is the largest strictly fresh-water game fish ever caught in America.

Another outstanding catch was a 55-lb. Atlantic salmon landed by Esmond B. Martin in the Grand Cascapedia of Quebec. While this does not establish a new world's record it is a much larger salmon than has been landed in North America for some time.

As far as big fish are concerned, there was one other incident of considerable concern to fresh-water fishermen. This was a 36¾-lb. brown trout found in the Logan river in Utah. Although this trout was not caught on rod and reel, it is of interest because it shows the enormous size to which these fish may grow. The largest brown trout ever before reported in North America weighed 25¼ lb., lighter by more than 10 lb. than this latest Logan river monster. (D. Ho.)

Anglo-Egyptian Sudan. Area 967,500 sq. mi.; pop. (est. 1938) 5,719,819. Chief towns: (pop. 1938) Khartoum (46,676); Omdurman (110,959); Port Sudan (21,773); Atbara (19,757); El Obeid (27,390). Governor-general: Lt.-Col. Sir Stewart Symes; languages: English and Arabic; religion: Mohammedan.

History.—In contrast to 1938 the Nile flood in 1939 was abnormally low and river cultivation below Khartoum suffered in consequence. Sufficient late rain fell, however, to ensure a good grain crop throughout the country. Locusts arrived in force early in the season but were attacked by disease and discouraged by drought and did little damage. The outbreak of war resulted in some disorganization of trade and prices rose immediately. Emergency legislation coupled with the resumption of more normal shipping services quickly checked this.

Through a network of supervisory public health officials spread over this vast country, anti-mosquito work has been intensified

and propaganda disseminated to improve housing, nutrition, water-supplies, and public health in all its aspects. Public security remained satisfactory throughout the year.

Education.—Intermediate schools 11, scholars 1,573; higher: secondary schools 465, post-secondary schools 73.

Banking and Finance.—In 1938: revenue £7,574,000; expenditure £7,293,000; public debt (Dec. 31, 1938) £13,873,800.

Trade and Communication.—In 1938: imports £E6,283,000; exports £E5,490,000. Communications: roads, suitable for motor traffic, all weather c. 1,000 mi.; railways 1,991 mi.; river service 2,325 mi.; motor vehicles licensed (1937) 4,354 cars, commercial vehicles and cycles; telephone subscribers (1937) 2,383.

Agriculture and Mineral Production.—Production: (in metric tons) cotton seed (1938-39) 105,000; ginned cotton (1938-39) 60,000; millet (1937-38) 315,000; sesamum (1937-38) 33,000; maize (1937-38) 10,000; wheat (1937-38) 8,000; ground-nuts (1937-38) 8,500; gold (1938) 252 kilograms.

Angola: see PORTUGUESE COLONIAL EMPIRE.

Animal Fats: see VEGETABLE OILS AND ANIMAL FATS.

Annam: see FRENCH COLONIAL EMPIRE.

Anniversaries and Centennials: see CALENDAR, 1940, page xx.

Antarctic Exploration: see EXPLORATION AND DISCOVERY: *Antarctic*.

Anthropology, the science of man in terms of his physique, his language, and most importantly his culture, is steadily differentiating into a series of separate disciplines, as the treatment of each of its aspects becomes more complex. In the past, much attention was given to discussions of the inter-relationships and virtual independence of language, race, and culture (F. Boas, *Race, Language, and Culture*, 1939). The emphasis now is shifting to broadening the relationships between the study of each of these separate branches and other related sciences; to increasing the ties between Primitive Linguistics and the Science of Language and Psychology; between Physical Anthropology and Endocrinology, with greater recognition of the social repercussions of physical processes such as growth and senescence. Cultural Anthropology is increasing its relationships with Psychology, Sociology, and Economics.



SKULL OF A NEANDERTHAL CHILD discovered in July 1939, in Uzbekistan, U.S.S.R., by Dr. A. P. Okladnikov, young Soviet archaeologist. Dr. Ales Hrdlicka of the Smithsonian Institution, who was in Russia at the time, described this discovery as one of the utmost importance to anthropology.

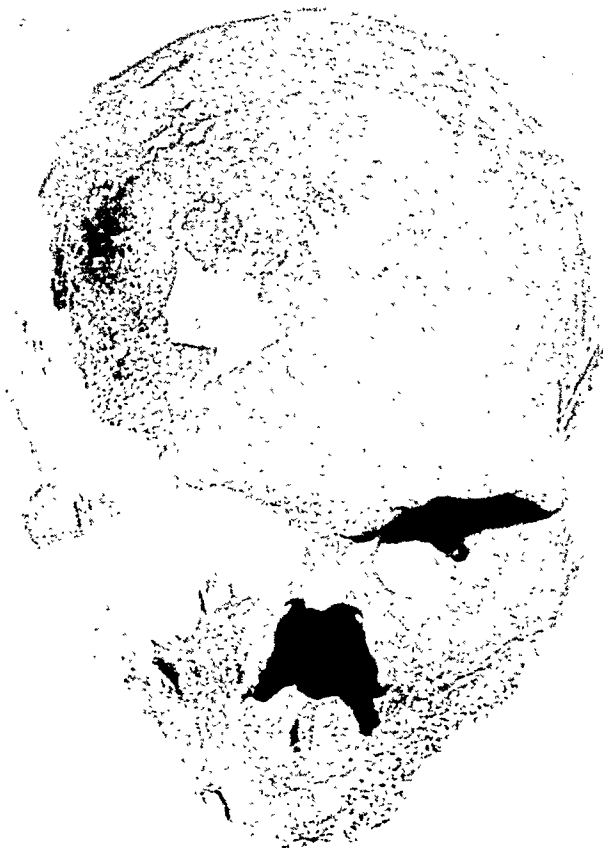
There has been a steady decrease in funds available for research, especially in long-time grants from the big foundations, and there is also a continued drift away from the support that was once given to ethnological and archaeological work by private collectors. Hence, archaeology is coming to look more to Government support. In the South American countries there is a general trend to combine an interest in antiquities with national promotion programs; in the United States, both the Federal Government and an increasing number of State and inter-State archaeological associations have recently engaged in work of professional quality. Archaeology is also coming to depend upon an interest in primitive arts (G. C. Vaillant, *Indian Arts in North America*, 1939), an interest which was stimulated by the exhibits at the Golden Gate International Exposition, San Francisco, 1939. Aside from the regular Federal agencies for ethnological research (Smithsonian Institution and Bureau of American Ethnology), there has been no extensive utilization of students of culture by Government agencies, either in dealing with Indian tribes or in solving the problems of racial and cultural minorities.

Physical anthropology, once confined almost entirely to the study of racial types, is tending to combine with human biology, placing increasing emphasis on studies of growth (Brush Foundation, Cleveland, Ohio, Grant Study of the Normal Man at Harvard; see also F. K. Shuttleworth, "The Physical and Mental Growth of Girls and Boys Age Six to Nineteen in Relation to Age at Maximum Growth," *Child Development Monographs* vol. 4, no. 3, 1939) and the relationship between the organism and the milieu (H. L. Shapiro, *Migration and Environment*, 1939). The application of endocrinological findings to human problems with social and psychological significance finds expression in a number of studies (M. F. Ashley-Montagu, "Adolescent Sterility," *Quarterly Review of Biology*, vol. 14, nos. 1 and 2, 1939; *Problems of Aging*, edited by E. V. Cowdry, 1939). Work in blood groups is continuing (see P. N. Candela, "Blood Group Tests on Stains, Mummified Tissues and Cancellous Bones," *Amer. J. Physical Anthropol.* 25:187-214). A third *Pithecanthropus* specimen was found ("Discovery of an Additional *Pithecanthropus* Skull," *Nature*, October 15, Communication from G. H. R. von Koenigswald and F. Weidenreich), and also a new Neanderthal specimen in Central Asia by A. Okladnikov and his wife (note by A. Hrdlicka, *Science*, Sept. 29, 1939).

In North American archaeology, of special note was the discussion on the antiquity of man in America at the Sixth Pacific Science Congress (California, July 24-Aug. 12, 1939); the finds of "women's knives" in association with Indian artefacts characteristic of the region (J. H. Bailey, "A Ground Slate Producing Site Near Vergennes, Vermont," *Bull. Champlain Valley Archaeological Society*, vol. 1, no. 2, 1939); and the find by F. H. Roberts of small beads in the Lindenmeier site in association with the Folsom culture.

In Central American archaeology, the most conspicuous find was the discovery of the earliest known Mayan date at Tres Zapotes. The long-time archaeological projects under the American Museum of Natural History, the Carnegie Institution, the National Geographic Institute, and Tulane university are continuing.

In the study of culture, man's non-biological inheritance, there are several marked, but not necessarily incompatible trends: (1) the continuation of the historical method, best exemplified by the American school and at present by the work of the University of California, in which emphasis is upon the establishment of sequences, the examination of problems of change and diffusion by a series of comparative studies of related cultures, and in which the unit of discussion is the trait, with a certain growing tendency to introduce quantitative methods (Kroeber, Kluckhohn.



THE MOST PERFECTLY PRESERVED Neanderthal skull yet discovered was found in 1939 on Monte Circeo, near Rome

Lowie); (2) the examination of social processes, in which it is possible to distinguish several methods of approach—(a) that which is concerned with the way in which individual psychological processes become embodied in cultural forms, are shaped by cultural forms, and provide the dynamics for social equilibrium and social change (Bateson, Benedict, Mead); (b) that which is concerned with the study of society within which the individual acts in terms of socially defined roles and the unit of study is either the individual as a member of the group, or the group (Radcliffe-Brown, Linton, Warner); (c) that which primarily attacks cultural processes diachronically in terms of widely distributed groups of common origin or different levels of social integration (Herskovits, Redfield); (d) that which analyzes societies in terms of the functioning of institutions assumed to be comparable from society to society because they meet the same needs (Malinowski, Firth). These various methods of approach are of uneven age and are defective in that they employ field techniques which permit students unevenly trained or gifted to assemble usable materials. In this respect the approach to culture as an expression of individual psychology and its effect upon moulding the growing personality has been least happy, but recent emphasis upon the development of various techniques such as the use of the life history (W. Dyke, *Son of Old Man Hat*, 1938), of projective methods (David Levy, "Sibling Rivalry Studies in Children of Primitive Groups," *Amer. J. Ortho-Psychiatry*, vol. 9, no. 1, p. 205, Jan. 1939), extensive use of Cine and still photographic recording of behaviour (Bateson and Mead: "Research in Bali," *N.Y. Aca. Sciences, Trans. Ser. 2*, vol. 2, no. 1, Nov. 1939), and the use of the methods of experimental psychology (S. F. Nadel, *Experiments on Culture Psychology, Africa*, 1937) is doing much to remedy this defect. (See also *The Study of Society*, London, 1939.)

There is evidence of increased cross fertilization, both in methods and in concepts, between the study of culture and other social sciences. Of especial interest are: the attempt of Kardiner, in co-operation with Linton, to re-examine and refine upon psychoanalytical concepts by testing them out upon material from

primitive cultures (A. Kardiner, *The Individual and His Society*, 1939); Erikson's efforts, in co-operation with McKeel, to make a psychoanalytic approach to Sioux education (E. J. Erikson, "Observations on Sioux Education," *J. Gen. Psychology*, 7:101-156); Lynd's suggestion that the various discrete social sciences use the concept of culture as a way of defining a common field of material upon which their various techniques could be brought to bear co-operatively in the solution of selected problems (R. S. Lynd, *Knowledge for What*, 1939); and the co-operative attempt of a group of social scientists at the Institute of Human Relations, Yale, to develop a hypothesis and test it out on a variety of materials, one of which was the records of a primitive culture (*Frustration and Aggression*, 1939).

The most significant development in linguistics took place in Mexico, where the Department of National Education and the National Polytechnical Institute initiated a project for the study of native dialects under the direction of M. Swadesh, which combines the most sophisticated linguistic techniques with application to practical educational problems approached from the phonemic point of view.

The outbreak of the war has made it impossible to get full reports from abroad. In the totalitarian countries research continues to be centred upon questions in which controversial issues will not be raised—on archaeology and linguistics in the U.S.S.R., and on various apologias of the current political theories of race in Germany.

In the U.S.S.R. archaeological research is part of a comprehensive program of exploring sites from Palaeolithic times down to the feudal antecedents of modern Russia. This extensive and expanding program is combined with the preparation of very complete treatises on the ethnography and dialects of the various peoples of the U.S.S.R.

In England, institutional anthropology, in the form of association meetings and publications, are continuing, but anthropological research, which had already been suffering from curtailment of funds and from the rapid westernization of primitive peoples available for study, will, because of the war, undoubtedly suffer further drastic interruption, not only in field work but also in the very type of research into cultural processes which is so essential to our knowledge of how to control human institutions so as to prevent war.

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Anti-Aircraft Weapons: see MUNITIONS OF WAR.

Anti-Comintern Pact: see FASCISM.

Antigua: see WEST INDIES, BRITISH.

Anti-Lynching Legislation: see LYNCHINGS.

Antimony. World production of antimony is estimated at 30,000 metric tons in 1938, against 37,000 tons in 1937. Decreases of 48% in China and 25% in Mexico were only partly offset by increases of 32% in Bolivia and 90% in Yugo-

slavia. Formerly China supplied about 70% of the demand, Mexico 10%, and Bolivia 7%, the remaining 13% being scattered among 20 or more minor producers, but in 1938 China supplied only 26%, Bolivia 29%, Mexico 25%, and Yugoslavia 4%. The United States has no regular ore production, but several hundred tons annually are recovered as a by-product in the smelting of lead, and since 1931 an antimony smelter has been in operation in Texas, using imported ores. The output of this smelter exceeded 4,900 metric tons in 1937, and has been responsible for a considerable increase in the ore outputs of Mexico, Bolivia, and Peru with a corresponding decrease in the imports of ore and metal from China. The United States is the largest consumer of antimony, taking about one-half of the world supply of new metal to satisfy two-thirds of its consumption demand, the other third being furnished by secondary metal recovered after previous use. The Chinese industry has been badly disorganized by the Sino-Japanese conflict, and though smelting operations continued, shipments during 1938 were much reduced. Total exports declined 48% to 7,797 metric tons in 1938. (G. A. Ro.)

Anti-Saloon League of America, Inc.

A non-partisan, interdenominational temperance organization formed in 1895. It is a federated movement, the National Board of Directors being elected by the Boards of the State Leagues. The governing bodies of the State Leagues are elected or appointed from the co-operating religious denominations and civic groups. The work in the States is in charge of State superintendents elected by the State Leagues, of which there were 37 in 1939. A co-operating relationship was maintained with committees or temperance units in the other States. During the current year the league has worked to carry out the policies outlined by its National Board of Directors at its biennial meeting at Columbus, Ohio, in Dec. 1938.

The league opposed before the State legislatures, most of which met during the year, enlarged privileges for the liquor traffic; favoured restriction in hours of sale, number of licences, and the prohibition of their issuance in rural and inadequately policed territory or in the vicinity of schools; sought local option legislation where it was denied, and in other ways favoured legislation to diminish progressively the sale and consumption of alcoholic beverages. The league advocated legislation before the 76th Congress to prohibit the advertising of alcoholic beverages in interstate commerce, and amendments to the Liquor Law Enforcement Act of 1936 to effectively protect the States against the importation of liquor for use or delivery in violation of State law. In the Senate a bill to prohibit the advertising of alcoholic beverages over the radio was reported favourably by the Committee on Interstate Commerce. The national headquarters are at 131 B street S.E., Washington, D.C. (E. B. Du.)

Anti-Semitism. The violent anti-Semitism which had reached its culmination in Germany in the events of Nov. 1938 and in the ensuing legislation aiming at the complete dispossession and extermination of the Jews in Germany, continued in 1939. Through Germany's conquests of Czecho-Slovakia and Poland the spirit and measures of National Socialist anti-Semitism were spread to these two countries. The number of Jews in countries directly affected by the National Socialist legislation may be estimated at about 4,000,000. By a tragic irony National Socialism which had wished to eliminate all Jews from Germany brought by its subsequent conquests of Austria, Czecho-Slovakia and Poland many more Jews under its control than there had ever been in Germany. This paradoxical situation forced National Socialism into ever more ferocious and ruthless

measures against the Jews. Ultimately, in the fall of 1939, the National Socialists proposed the creation of a Jewish "reservation" in south-eastern Poland near Lublin where, according to original plans, all the millions of Jews from Germany, Austria, Czechoslovakia, and Poland were to be concentrated on a small and overcrowded space, being sent there without money or sufficient clothing, and exposed to starvation and inhuman treatment. By the end of 1939 a beginning with the transfer of Jews to this reservation had been made. The fate of the Jews in Poland, after the conquest of the country by National Socialist Germany, surpassed in the treatment meted out to the Jews even the worst events and measures in Nazi Germany herself.

Fascist Italy started to imitate on July 14, 1938, the anti-Semitic policy of National Socialist Germany. Since then anti-Semitism has become as dominant an institution in Italian legislation as it is in Germany. The expression of anti-Semitism in the Italian press reaches the same depth of vulgarity as in the German press. A special periodical, called *La Difesa della Razza*, was created for this purpose. Italy's definition of race, was, however, less stringent than the German one. A law of Feb. 9, 1939, forbade Jews to own land with a combined taxable value of more than 5,000 lire or urban buildings of a combined taxable value of more than 20,000 lire. Jewish enterprises with more than 100 employees were expropriated. A decree on June 1, 1939, forbade any collaboration between Jewish and non-Jewish lawyers, physicians or dentists, Jewish members of the professions being allowed to attend only to Jewish clients. All foreign Jews had to leave Italy within six months. Civic equality for the Jews had been the last remnant of the liberal tradition of Fascist Italy; the Fascist alliance with National Socialist Germany resulted in the complete co-ordination of Italian with German policy.

In Rumania anti-Semitism continued, without, however, giving during 1939 rise to any new special legislation. In Hungary, the anti-Jewish laws went into effect on Oct. 1, 1939. In their racial definition as well as in the number of exemptions this Hungarian law is very much milder than the corresponding German legislation. Under certain conditions Jews retained the suffrage and the right to be elected to national and municipal legislative bodies. Jews were to be excluded from public offices, the civil service and the teaching profession, and to be restricted in the other liberal professions to not more than 6% of the total number of persons engaged in the profession, and to 12% in other economic pursuits. The Hungarian Government suppressed, however, all attempts on the part of Hungarian National Socialists to start violent anti-Semitism according to the German model. One of the results of the National Socialist attitude towards the Poles and Czechs, whom they treated similarly to the Jews as "inferior" races, and against whom they applied discriminating legislation and humiliating treatment, was the growth of greater sympathy on the part of the Czechs and the Poles for the Jews. It became clear that the anti-Jewish legislation had been only the entering wedge for a similar treatment of other races once they were put into a similar helpless position as the Jews were.

The year 1939 saw also a definite increase in anti-Semitic agitation in the United States. Among the most active in this respect were various groups organized as "Christian Front" and "Christian Mobilizers." This anti-Semitic propaganda was most actively supported by the National Socialists who liked to arouse the opinion that the responsibility for the gathering war clouds in Europe and later for the war was not to be attributed to National Socialist aggressiveness, but to "Jewish war mongers." Father Coughlin used to denounce in his weekly broadcasts in the first part of the year all anti-National Socialists as war mongers and to praise National Socialism as a reaction to and as a defence against Communism. The unexpected conclusion of an alliance

of National Socialism with Communism has created a momentary difficulty for anti-Semitic propaganda in America, as the beloved identification of "Jews" and "Moscow" and the praise of anti-Semitic National Socialism as a bulwark against both could not be maintained any longer. Anti-Semites had to drop their previous rationalizations, and try a number of new ones without, however, being able to agree yet upon a definite line. The "revelations" of Major General George Van Horn Moseley before the Dies Committee for the investigation of un-American activities clearly showed the length to which anti-Semitic prejudice can go. (See also BOHEMIA AND MORAVIA; FASCISM; ITALY: *Home Affairs*; JEWISH RACE, DISTRIBUTION OF; JEWISH RELIGIOUS LIFE; REFUGEES.)

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Anti-Trust Law: see LAW (CASE): *Anti-Trust*; UNITED STATES.

Appeasement Policy: see EUROPEAN WAR; FRANCE; ITALY: *History*; GREAT BRITAIN.

Apples. Heavier war-risk shipping charges and scarcity of cargo space, as well as import restrictions disrupted the market in the United Kingdom and Europe for United States and Canadian apples. As a result, an appreciable part of the U.S. crop was left unharvested because of low prices, while in Canada the Government came to the relief of growers by proposing to purchase 1,500,000bbl., and possibly 1,750,000bbl., of the Nova Scotia crop, estimated at 2,169,000bbl., such purchases to be processed. It was also proposed that the Government buy 500,000 boxes of British Columbia and 150,000bbl. of Ontario apples. The 1939 crop in Canada was reported as 5,135,000bbl., as against 5,222,400bbl. in 1938. The November 1 estimate of the Department of Agriculture placed the 1939 United States commercial crop at 100,300,000bu., compared to 82,395,000bu. in 1938 and a ten-year average (1928-37) of 96,469,000 bushels. This 1939 estimate is for fresh consumption sales and allows for diversion by the Federal Government in purchases of fresh fruit for relief distribution. United States apple exports in Sept. 1939, were only about two fifths of Sept. 1938.

Apple Production by States, 1938 and 1939

	1939 Bushels	1938 Bushels		1939 Bushels	1938 Bushels
Washington	19,500,000	22,400,000	Maine	900,000	506,000
New York	14,500,000	10,464,000	New Hampshire	590,000	400,000
Michigan	7,800,000	4,800,000	Vermont	810,000	276,000
Virginia	7,500,000	7,268,000	Kansas	770,000	500,000
Pennsylvania	6,100,000	3,800,000	Arkansas	625,000	175,000
Ohio	5,800,000	1,950,000	North Carolina	580,000	480,000
Illinois	4,700,000	1,900,000	New Mexico	580,000	400,000
California	4,600,000	5,019,000	Wisconsin	500,000	310,000
West Virginia	4,000,000	3,227,000	Georgia	450,000	420,000
New Jersey	3,950,000	2,900,000	Montana	320,000	310,000
Massachusetts	2,420,000	1,583,000	Utah	300,000	345,000
Idaho	2,150,000	2,451,000	Kentucky	300,000	130,000
Oregon	2,000,000	2,617,000	Iowa	260,000	340,000
Delaware	1,750,000	1,450,000	Nebraska	250,000	350,000
Maryland	1,700,000	1,419,000	Rhode Island	250,000	308,000
Missouri	1,400,000	250,000	Tennessee	230,000	120,000
Indiana	1,350,000	700,000	Minnesota	175,000	145,000
Colorado	1,100,000	1,746,000	Oklahoma	55,000	50,000
Connecticut	1,030,000	986,000	Arizona	35,000	32,000

(S. O. R.)

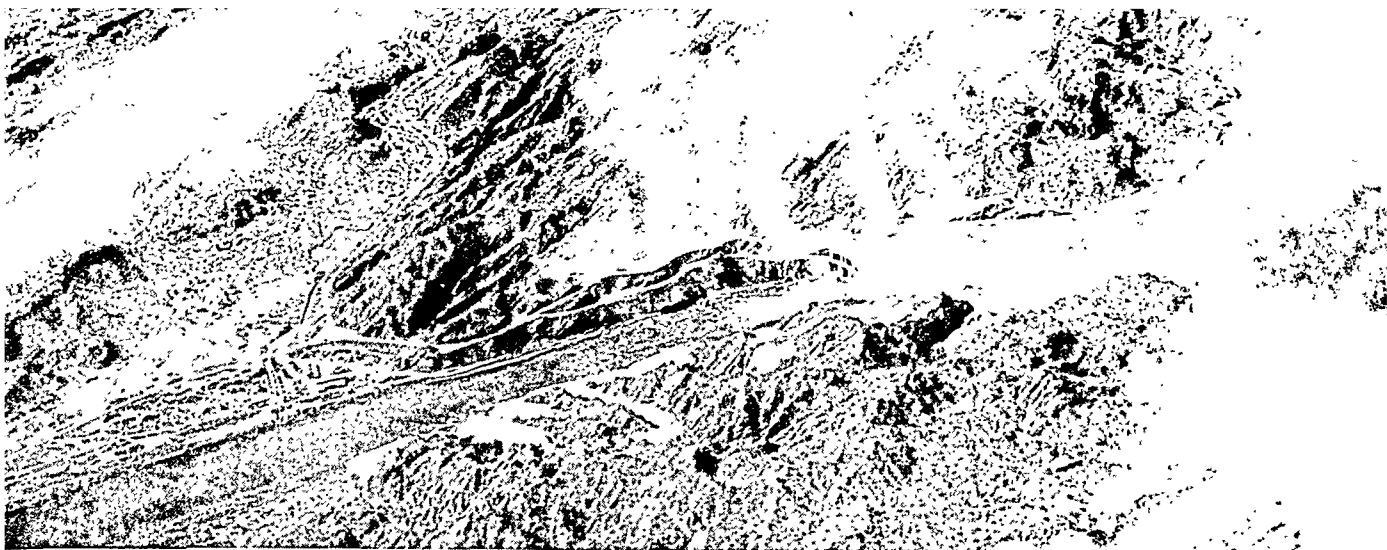
Applied Chemistry: see CHEMISTRY, APPLIED.

Applied Psychology: see PSYCHOLOGY, APPLIED.

Appropriations and Expenditures: see GOVERNMENT EXPENDITURES.

Aquariums. The aquarium situation has been relatively quiet throughout the year 1939. Much of this has been due to general unsettled world conditions.

With the outbreak of war in Europe in the latter part of the year, the consequent disruption of shipping has greatly hindered



STARTING POINT of the world's greatest aqueduct system, completed in 1939, is Parker dam on the Colorado river near Parker, Arizona. One billion gallons of water are carried daily 242mi. to Los Angeles and 12 other cities on the Pacific

long distance transportation of aquatic animals, even between regions not intimately connected with the war zones. Consequently, until adjustments are made it follows that aquaria generally must depend more on emphasizing the exhibition of less distant forms of life than during periods of free interchange and active commerce. Unlike zoological gardens, however, public aquaria in locations liable to attack by air feel no pressure to remove animals that might become dangerous to the general public. The physical limitations of aquatic forms of life, no matter how vicious in their own environment, preclude their becoming a public menace under war hazards. Before war conditions virtually shut off such commerce, the collections of many aquaria were enhanced by the importation of interesting innovations. For example, two species of the African family Mormyridae have found their way to America for the first time. These fishes, closely associated with Egyptian mythology, have been seen at times in European aquaria but never before in American institutions. The finding of a single specimen of a supposedly long extinct group of fishes, the Coelacanth, off the east coast of Africa, has generally excited the imaginations of aquarium administrators with high scientific hopes. The smallest tarpons on record have been displayed in New York, a matter of no small interest to anglers devoted to the pursuit of this species. (See also ZOOLOGY: *Specific Contributions*; for picture see MARINE BIOLOGY.) (C. M. Br.)

Aqueducts. The All-American canal, the largest irrigation ditch in the United States, being built by the Federal Bureau of Reclamation at an estimated cost of \$38,500,000, was virtually completed. It will carry water diverted from the Colorado river by Imperial dam for a distance of 80mi. into the Imperial valley, California. With the 130mi. Coachella Branch canal, which was started in 1938, water will be supplied ultimately for irrigating approximately 1,000,000ac. of land in southern California. The Colorado river aqueduct, now under construction by the Metropolitan Water District of Southern California, extends 242mi. from the river near Parker, Arizona, to Cajalco reservoir, 12mi. south of Riverside, California. On Jan. 7, 1939, the first water flowed into the aqueduct when the Intake pumping plant was placed in operation. With all major features completed, including 29 tunnels with a combined length of 92.1mi., the project, estimated to cost \$220,000,000, will deliver 1,000,000,000 gal. of water per day to Los Angeles and twelve neighbouring coastal cities. Work was in progress on the Delaware river aqueduct, an 85-mi. pressure tunnel, which will carry additional water supplies from the Catskill mountains to New York city. Extending from the proposed Roundout reservoir at Lackawack, New York, to

Hill View reservoir in Yonkers, the new project, estimated to cost \$273,000,000, will increase the city's water supply by 50%. Twenty-three of the 30 shafts required for the project were completed in 1939. To safeguard and improve Boston's water supply an 18-mi. pressure aqueduct, consisting mainly of a large size pre-cast concrete pipe, is being built from the Wachusett reservoir to the Boston metropolitan district. The 11.3-mi. Mono Craters tunnel, which will deliver an average additional 140 sec.-ft. of water from Mono Basin to the Los Angeles aqueduct to improve the water supply system of Los Angeles, was holed through in April 1939. An ingenious 47-mi.-long gravity system of mountain tunnels and giant pipelines has been built to provide San Francisco with a limitless supply of water and power from the O'Shaughnessy dam in Hetch-Hetchy valley, California. Construction began the latter part of 1938 with two tunnels on a 40-mi. aqueduct which will carry stored water from Deer Creek reservoir in Provo canyon over steep and irregular mountain slopes to Salt Lake City, Utah. (See also DAMS.) (J. C. PA.)

Arabia. Total area (estimated) 1,000,000 square miles. Total pop. (estimated, 1937) 9,300,000; Saudi Arabia, 4,500,000; Yemen 3,500,000; Oman and Muscat 500,000; Kuwait 80,000; Trucial Sheikhs 80,000. Language: Arabic; religion: Mohammedan. Rulers: Saudi Arabia, King Ibn Sa'ud; Yemen, Imam Yahaya Muhammad Hamid ed Din; Oman and Muscat, Sultan Sayyid Said bin Taimur; Kuwait, Sheikh Ahmed Ibn Jabir al Subah.

History.—The year 1939 marked an important turning-point in the history of Arabia inasmuch as it became for the first time since pre-Islamic days a producer and exporter of minerals. In the mountainous western district of Hejaz gold has been discovered at various points and a promising mine has been developed at Mahad al Dhahab 100mi. south of Medina. By the end of the year some 600 tons of concentrates had been exported to America for refining. But, more important than gold, oil has been discovered in encouraging commercial quantities in the eastern districts of Arabia, notably at Kuwait and Dhahran. The latter field, or rather the pipe-line connecting it with the Persian gulf port of Ras Tanura, was opened in April and by the end of 1939 oil exports were being shipped to the tune of 20,000bbl. (3,000 tons) a day.

The production of oil and gold, meaning a steady revenue for the government of Saudi Arabia, comes at an opportune moment to augment the slender resources of the country which has hitherto been mainly dependent on a fluctuating pilgrimage to Mecca. During the depression of 1931 the number of pilgrims visiting the Hejaz fell from an average of 100,000 to 21,000. Since then there had been a steady recovery until in Jan. 1939, the figure had risen to 65,000. Unfortunately the shadow of war darkened the country's

prospects and the actual outbreak of war in September realized the worst fears of the pessimists. The number of pilgrims in Jan. 1940, will be below 25,000 and the consequent loss of revenue to the government as well as the effect on merchants and people may be left to the imagination. (H. St. J. B. P.)

Trade.—With India (1938-39): Oman and Muscat, imports £284,250; exports £153,750; other states of Arabia, imports £486,000; export £48,000. With the United Kingdom (1938): Saudi Arabia and Yemen, imports £94,960; exports £28,871; Oman and Muscat, Trucial Sheikhs and Kuwait, imports £40,262; exports £18,354. Total trade of Oman and Muscat (1937-38): imports £312,534; exports £247,426; Kuwait (1937-38): imports £410,812; exports £174,006.

Arbitration, International: see PERMANENT COURT OF INTERNATIONAL JUSTICE.

Arbós, E. Fernandez (1863-1939), Spanish conductor and violinist, was born in Madrid December 25 and received his early musical training at the Madrid conservatory. In 1883 he became concert-master of the Berlin Philharmonic orchestra, and thereafter made a notably successful tour of Europe as a violinist. In 1903 he was concert-master of the Boston Symphony orchestra, and later he was guest conductor of orchestras in France, Russia, England, and other countries. He was appointed conductor of the Madrid Symphony in 1908 and retained this position until his death. The best known of his compositions are a comic opera, *El Centro de la Tierra* (1895), the ballet *En Triana*, and his orchestral transcriptions of the works of Albeñiz. His death at San Sebastian, Spain, was reported in London on June 10.

Archaeology. The outstanding event of 1939 in American archaeology was the 27th International Congress of Americanists, held in Mexico City, on August 5 to 15. In addition to the scientific sessions on various anthropological subjects, the program included numerous trips to the famous archaeological sites of the vicinity.

The year 1939 was marked by increased archaeological activity in the field, not only through further studies in well known areas, but also by additional investigations in areas which until recently received little attention. Additional light has been thrown upon the important problem of the antiquity of man in the New World. The Bureau of American Ethnology continued its work at the famous Lindenmeier site in northern Colorado. The study of the Oregon cave deposits was carried forward. Evidences of a Folsom culture and pleistocene deposits were found in a New Mexico cave by a University of New Mexico expedition. In the Great Lakes area, a field party from the University of Michigan encountered records of human occupation associated with post-glacial beaches, indicating considerable antiquity.

Well over half a hundred universities, museums, societies and research organizations sponsored field expeditions in all parts of the United States. Some of these were single season projects, others were parts of long term programs. Among the better known ones, the Awatovi (Arizona) Expedition of the Peabody museum of Harvard completed its fifth and final field season; the Tennessee Valley Authority's explorations of the Tennessee valley basins were continued; and the University of Chicago conducted its sixth season at the Kincaid site in southern Illinois. During the year a long term program was begun, when the Indiana Historical Society and Historical Bureau sponsored the first season's field work at the Angel Mounds site in southern Indiana.

Important discoveries were made in an ancient Eskimo village at Point Hope in Alaska by a joint expedition of the University

of Alaska and the National Museum of Denmark. A preliminary archaeological survey of the east coast of Hudson's Bay was made on behalf of the University of Chicago. During the summer the National Museum of Canada sponsored excavations of a woodland site in the Grand River valley, near Dunnville, Ontario.

Northern Mexico received additional attention in 1939. The American Museum of Natural History engaged in a reconnaissance and excavation project in northwestern Mexico. The Peabody museum of Harvard sent a reconnaissance party to the western part of the State of Coahuila. The University of California, in collaboration with the Instituto Nacional de Antropología e Historia, sponsored a surface survey of archaeological sites along the Pacific coast of Mexico.

In the Valley of Mexico and the southern part of the Republic, the Mexican Government continued its extensive and far-sighted program of excavation and restoration among the great ruins of the region. A joint expedition of the Departamento de Monumento of Mexico and the Carnegie Institution of Washington made field studies in the important Tuxtla region of Vera Cruz. Near the village of Tres Zapotes, in the same region, another expedition sent by the National Geographic Society and the Smithsonian Institution made some important discoveries, including a fragment of a stone monument bearing one of the earliest known dates in the Maya calendar.

The Carnegie Institution of Washington also continued its archaeological studies in the highlands of Guatemala and northern Honduras. The University of Pennsylvania museum prosecuted its eighth and final season at the ruins of Piedras Negras, Guatemala. A small party from the School of American Research excavated a site in southwestern Guatemala during the spring of the year. At the same time a representative of the Peabody museum of Harvard carried on some excavations on the island of Haiti.

Although detailed information on the archaeological activities in South America during 1939 is not at hand, it may be assumed that the research programs of governments and institutions in Argentina, Brazil, Bolivia, and Peru have been continued. An expedition from the Peabody museum of Harvard spent six months excavating at Pucara, Peru.

Within the United States the continued availability of Federal relief facilities (WPA), stimulated both field and laboratory work. Organizations with established archaeological programs found it possible to expand their activities, and a number of



AN IMPORTANT ARCHAEOLOGICAL DISCOVERY of 1939 was the tomb of one of the Sheshonks, Egyptian Pharaohs of the 22nd dynasty, opened in March at Sanel-Hagar on the Nile delta by Prof. Pierre Montet of Strasbourg

smaller societies were able, with the assistance of trained archaeologists, to undertake field and laboratory work with the aid of the WPA facilities. For some years there has been a growing interest in the application of archaeological methods to the study of documented and historic sites. During 1939, the sponsorship of such procedures by the National Park Service served to stimulate the study of these sites. One outstanding example is the investigation by Phillips Academy of Andover, Massachusetts of the remains of an old fish weir found some 40 feet below street level in Boston.

In the southwest, studies were made of the lesser known peripheral archaeological cultures and of detailed relationships within the better known groups, especially the Mogollon complex. Continued research in the northcentral States led to a clarification of many detailed cultural relationships. The most noticeable growth in knowledge occurred in the southeastern area, where many students devoted the year to determining the fundamental data upon which an outline of the cultural sequences in this area will ultimately be built. The work done in other regions of the United States, particularly on the Pacific coast, in the Great Plains, and in New England, added substantially to archaeological knowledge. The improvements in field methods, and the emphasis upon laboratory work, were reflected in the growing consideration given to problems of methodology, nomenclature, and classification of data. An increased appreciation developed of the interdependence of projects and problems, not only within archaeology, but also in relation to geology, geography, biology, physical anthropology, ethnology, and history.

Since the full interpretation of field materials can only be accomplished through laboratory work, the increase in the number of expeditions was paralleled by a corresponding growth in laboratory facilities and activities. The year 1939 saw the development of several large archaeological laboratories, particularly in the southeastern States, where the results of excavations were studied under careful technical supervision with the aid of WPA facilities. The many small laboratories maintained by individual organizations, and the several co-operative laboratories devoted to particular specialties continued to operate.

In addition to the annual meetings of various associations and societies a number of conferences were held. One of the best known of these was the Chaco Conference, held in New Mexico late in the summer, under the auspices of the University of New Mexico. About the same time a Tree-Ring Conference was held in the same area at a field station of the University of Arizona. In the late spring and the early fall two meetings were held of the Southeastern Archaeological Conference. In October the annual meeting of the Northeastern States Archaeological Federation, which is in the nature of a conference, was held in New York city. Such meetings are of especial value because they permit the many workers in limited areas to discuss current archaeological activities and compare opinions and points of view.

BIBLIOGRAPHY.—The great majority of publications during 1939 consisted of technical reports and articles in the journals and serials of various institutions and organizations. Further information concerning them, as well as additional details upon the archaeological activities of the many organizations working in the United States in particular, may be secured by consulting vol. V of *American Antiquity*, the quarterly journal of the Society for American Archaeology. The outstanding publication of the year was the five volume monograph entitled *The Inscriptions of the Pecten* by Sylvanus G. Morley, published by the Carnegie Institution of Washington with the imprint of 1938, but distributed during the early months of 1939.

(C. E. Gu.)

Eastern Hemisphere.—In spite of upset conditions during 1939, important archaeological discoveries were made in many sections of the Old World. Those dating from the Neolithic and later periods will be dealt with regionally; for the earlier periods the evidence as a whole will be discussed.

The Palaeolithic Period.—Excavations conducted by Professor

Breuil during the past summer near Abbeville in the Somme valley, northern France, have yielded hand-axes of Abbevillian type in a deposit definitely of First Interglacial age. In the Breckland region of eastern England, Dr. T. T. Paterson has established the Pleistocene stratigraphy and the age of the associated Palaeolithic industries. The Breckland sequence is of primary importance to all prehistorians in western Europe.

In the Union of South Africa great progress is being made in the field of Old Stone Age research under the supervision of Professor C. van Riet Lowe, Director of the Bureau of Archaeology. The Fourth Annual Report of the Bureau, recently published in Pretoria, includes an imposing list of activities undertaken during the past year. A useful summary of the Stone Age in Northern Rhodesia by J. Desmond Clark of the Rhodes-Livingstone Institute demonstrates the importance of the region for relating the South African sequence to that of Kenya and Uganda on the east coast.

An important Upper Palaeolithic station, the Cave of Ksar 'Akil, near Antelias in Syria, is being excavated by Fathers Doherty and Ewing of Weston college. The work has revealed a far thicker deposit of Middle Aurignacian than has been found elsewhere in the Near East. In India, E. C. Worman, Jr. of the Peabody museum, Harvard university, has discovered important new Palaeolithic sites in the extreme south of the peninsula, on the east coast between Calcutta and Madras as well as in Central India north of the Narbada valley. The most outstanding fact concerning this material is its essential similarity to the hand-axe cultures (Abbeville-Acheulean) of western Asia, Europe, and Africa. In the Far East—Java, Malaya, Burma, and China (Choukoutien)—a Lower Palaeolithic chopping-tool complex has been recognized, an extension of which reached the Soan region of Northern India during Middle Pleistocene times.

Fossil Man.—Early in the year Dr. G. H. R. von Koenigswald of the Geological Survey of Java discovered a complete maxilla and a portion of the occipital region of a heavy male *Pithecanthropus* in the Trinil beds (Middle Pleistocene) at Sangiran in Central Java. The skull (*Pithecanthropus* No. 3) was broken prior to death as the result of a blow, and the stone apparently used for this purpose was found associated with the fragments.

The year 1939 witnessed the discovery of three Neanderthals—one in each continent of the Old World. The first find, an eight-year-old boy, was made by Dr. A. P. Okladnikov in the cave of Teshik-Tash near Tashkent in Russian Turkestan. The skeleton, examined by Dr. A. Hrdlička, was associated with Mousterian implements, prehistoric animal bones and ash layers. A few weeks later, Dr. A. C. Blanc of the University of Pisa recovered a very well preserved Neanderthal skull in the Guttari cave at the base of Mount Circeo south of Rome. The cave's mouth had been sealed in antiquity, and the skull together with the bones of an extinct fauna was found on the surface of the cave deposits, which contained Mousterian implements. The lower layers of the High cave in Tangier, where Dr. C. S. Coon of the Peabody museum, Harvard university, excavated during the spring and summer of 1939, yielded a maxilla fragment of a child and an adult molar tooth of Neanderthal type. The site revealed an important sequence of cultures from Middle Palaeolithic to Roman times. Thus, recent finds in Asia, Europe, and North Africa strengthen the view that the Neanderthal race dominated a large portion of the Northern Hemisphere of the Old World before the maximum of the last Pleistocene glaciation.

In Australia a joint expedition by N. B. Tindale of the South Australian museum and J. B. Birdsall of the Peabody museum, Harvard university, has discovered human skeletons together with a giant marsupial fauna in an ancient sand dune on the old shore of the now dry Lake Menindee, New South Wales. This is the

first time that human remains have been found in direct association with an extinct fauna in Australia.

Neolithic and Later.—(a) *Anatolia and The Near East.*—In Turkey, Professor John Garstang excavated at Mersin, near Tarsus, on the Cilician Plain. Below a series of Iron Age, Imperial Hittite, and pre-Hittite levels, five strata (XII–XVI) were found which represent stages in the development of the Chalcolithic of the Near East. The lowest of these levels (early fourth millennium B.C.) contains polychrome pottery identified by the excavators as Tell Halaf ware (*Annals of Archaeology and Anthropology of the University of Liverpool*, XVI [1939] pp. 38–72). The remaining 9000. of culture deposit below level XVI revealed a basal Neolithic horizon containing only plain wares and stone implements. The site demonstrates an extremely early occupation of the Cilician Plain, as well as a Chalcolithic culture which had connections not only with Anatolia but also with Crete, Greece, and the Danube valley. The Mersin stratigraphy as far back as level XII (c. 3000 B.C.) has been checked by the very extensive work being conducted nearby at Tarsus by Dr. Hetty Goldman. It is expected that when the early strata at Tarsus are uncovered these sites will complement each other and amplify the picture of the early periods in Cilicia. The wider spread of the Halaf culture has been further proved by the excavations at Shamiramalti (Tilke Tepe) on Lake Van by Dr. Kirsopp Lake. In every respect the pottery from the earliest level at this site, which is near Van Kaleh—the fortified citadel of the Vannic kingdom, is unquestionably related to the true Tell Halaf ware of Northern Mesopotamia and Syria.

In Syria, Dr. Schaeffer's fine excavations at Ras Shamra produced a specimen of Kamares ware imported from Crete in a level dating from the middle of the second millennium B.C. Its stratigraphic position at Ras Shamra suggests that the date for the end of Middle Minoan II should be lowered by approximately a century. The Oriental Institute's Syrian expedition conducted test digging north of Tripoli at Tabbat al-Hammam, a site with an early layer containing Tell Halaf pottery and a later occupation: first millennium B.C. to Byzantine. Sounding trenches at the nearby site of Tell Simiriyan revealed Middle and Late Bronze Age levels. Sir Leonard Woolley's excavations at Alalakh, near Antioch, have produced further proofs of direct contact between Minoan Crete and the Asiatic mainland early in the second millennium B.C.

During the winter of 1938–39 Lauriston Ward and D. W. Lockard of the Peabody museum, Harvard university, made an archaeological reconnaissance trip to Syria and Iraq. M. E. L. Mallowan excavated interesting Bronze Age levels at Tell Djidli, a mound near Tell Abiad in the Upper Balikh valley of Northern Syria. The French excavations at Mari, an important site on the Euphrates in Western Syria, were continued under the direction of André Parrot. Levels of the third and fourth (Jemdet Nasr period) millennia B.C. were uncovered, and more clay tablets bearing Sumerian inscriptions were found.

Only the German expedition under Professor Nöldeke worked in Iraq during 1939. Although their work was continued at Warka (Uruk), the most important finds were made at Tell Halat Hadji-Mohammed—a small mound in the vicinity. Here the only pre-Ubaid level known in Southern Mesopotamia was discovered. In certain respects the pottery from this new horizon recalls the well-known Halaf ware of the north.

Under the direction of Gordon Loud, the Oriental Institute's expedition continued work at Megiddo (Armageddon) in Palestine. Excavations conducted in two areas of the mound revealed a large building of strata VIII–VII, and a group of three houses of the Megaron type in stratum XV (1950–1850 B.C.). These houses, contemporary with the great Egyptian 12th Dynasty, were associated with a large circular altar of solid masonry. The ce-



ONE OF A SERIES of relief panels of a Roman emperor, probably Vespasian, discovered in 1938 and 1939 under the Palazzo della Cancelleria, Rome

ramic content of stratum XV (Middle Bronze I) includes a distinctive red ware, which continues in XIV but dies out in XIII (1800–1750 B.C.) with the appearance of Hyksos forms. In addition to continuing his important survey of Bronze and Iron Age sites in Trans-Jordan, Dr. Nelson Gleuck, director of the American School of Oriental Research in Jerusalem, excavated at Tell el-Kheleifi on the Gulf of Aqabah. The 1939 work at this site, believed to be Ezion-Geber referred to in the Book of Kings as Solomon's seaport, revealed an extensive smelting and refining plant. In level III (late 8th century B.C.) many interesting inscribed and stamped pots were found in addition to Phoenician glass beads and two Egyptian amulets.

(b) *Egypt.*—On the western edge on the Delta the German Institute's expedition under Professor Junker continued excavations on the important prehistoric site of Merimde. At Hermopolis, in Upper Egypt, Dr. Sami Gabra of the Egyptian university discovered an important tomb of a high priest in the precinct of the Temple of Thoth. The Oriental Institute again worked on the splendid records of the Medinet Habu Temple and Karnak. As in former years, Professor Michalowski of the University of Warsaw excavated in the Old and Middle Kingdom cemeteries at Edfu. Dr. George A. Reisner and members of the staff of the Harvard-Boston expedition spent the past year preparing the report on the Giza cemeteries for publication. At Giza, Selim Bey Hassan produced conclusive proof that the Temple of Cheops was decorated in relief with limestone carvings. This discovery is important, and the new pieces add materially to the very meagre evidence for the decoration of a royal temple before the beginning of Dynasty V. At Tanis, Professor Montet discovered two tombs of Dynasty XXII; one of them contained the electrum coffin and fine gold jewellery of Sheshonk, which are of wide interest from the point

of the history of Egyptian art. The contents of a tomb of Dynasty I, found by Walter B. Emery at Saqqarah, give a vivid picture of the really high civilization that flourished in the Nile valley at the very beginning of the Dynastic period. Emery's brilliant discovery was the most significant single event of the past year in the Egyptian field.

(c) *Greece*.—By re-examining previously excavated areas in the vicinity of the famous shaft-graves at Mycenae, Professor A. J. B. Wace has established that the royal tombs are only part of an extensive prehistoric cemetery used from Middle Helladic to Middle Mycenaean times (c. 2000–1450 B.C.). Below the summit of the acropolis at Mycenae unique Late Mycenaean objects—an ivory carving and the head of a plaster statuette—were found. At Dendra in the Peloponnese, Professor Axel W. Persson discovered five Mycenaean tombs, one of which (Tomb IV) proved to be the sepulchre of a queen containing magnificent gold objects of c. 1400 B.C. Data secured at Athens by the American school, directed by Professor T. L. Shear, refutes the theory that Athens was a third rate settlement in the Mycenaean period. On the northern slope of the areopagus a royal tomb, evidently that of a queen of the 14th century B.C., was found. In addition to pottery and a number of excellent gold and bronze objects, a beautifully carved cylindrical ivory toilet-box or pyxis came to light. Recent work at Pylos, in the South-West Peloponnese, by Dr. Karl Blegen and Dr. Kourouniotis has led to the discovery of a Late Mycenaean palace. This site has yielded evidence of the utmost importance, since in the palace archives a great mass of tablets inscribed with Minoan characters (Linear, Class B) was unearthed. These are the first to be found on the mainland of Greece and make it seem obvious that writing was more generally known in Late Bronze Age Greece than has heretofore been supposed.

(d) *The Balkans*.—Reconnaissance by James H. Gaul of the Peabody museum, Harvard university, has revealed that the Early Neolithic (Körös) culture of Hungary, as well as the culture overlying the Körös levels at Vinča (which is related to the Tisza culture of Hungary) both extend eastward into the Sofia region of Bulgaria. Furthermore Tisza pottery has been found at Olynthus near Salonica in Greece, and Vinča figurines have appeared at Dikili Tash in Greek Thrace. In the Upper Struma valley of Western Bulgaria, Mr. Gaul has discovered sherds identical with the Early Neolithic of Greece. At Karanovo in Southern Bulgaria, Dr. Vasil Mikov of the National Museum, Sofia, has proved that the Early Bronze Age culture of Macedonia (described by Heurtley) occurs above the Bulgarian Tell (Gumelnita) culture, which is of the Chalcolithic period. Thus the Macedonian Early Bronze Age forms an integral part of the Bulgarian development.

(e) *Western Europe*.—In Northern France, Dr. R. E. M. Wheeler of the London museum excavated several Late La Tène sites in Normandy. These proved to be hasty defences thrown up by the Gauls against the Roman invasions. Professor E. E. Evans of Queen's university, Belfast, continued his interesting excavations at Lyle Hill in Northern Ireland during 1939. This important site, a fortified hill-top camp with Windmill Hill pottery, is the first real Neolithic settlement to be excavated in Ireland.

By far the most spectacular discovery in Western Europe during 1939, and one of the most remarkable finds ever made in England, was the ship-grave of an Anglo-Saxon king found in the Sutton Hoo tumulus beside the river Deben in Suffolk. Careful excavation directed by C. W. Phillips revealed not only clear traces of the boat but also the outline of the ship itself—a vessel 82ft. long and 16ft. in the beam. The centrally located burial contained jewellery and personal belongings of barbaric splendour, which makes the tomb the richest of its kind so far found in Western Europe. The most impressive feature of the Sutton Hoo treasure is a set of provincial Byzantine plate; one magnificent silver dish

bears the marks of the reign of the Emperor Anastasius I. It has been suggested that the chieftain may have been Redwald, King of the East Angles (died c. 620 A.D.), who was the first of his lineage to become High King of England.

(f) *Poland*.—For the past five years extensive excavations under the direction of Professor J. Kostrzewski at the important Early Iron Age (700–400 B.C.) site of Biskupin, an island in a lake northeast of Poznan (*Travel*, Oct. 1939, pp. 16–19). This extraordinarily well preserved village, which covers an area 6½ac., was surrounded by high wooden fortifications; it has yielded rich finds of the ancient Slavonic culture. The streets, paved with logs, were laid out in parallel east-west rows between the wooden houses, with an outer one spanning the settlement inside the ramparts, the top of which served as a walk.

(g) *U.S.S.R.*—Expeditions from the Marr Institute of the History of Material Culture, Leningrad, have been active recently (H. Field, and E. Prostov, *Amer. Jour. Semitic Languages and Literature*, lvi, 1939, pp. 438–440). In the Crimea (Kerch Peninsula) B. F. Gaïdukevich continued excavation on a settlement belonging to the slave-owning Bosphorus kingdom (6th century B.C.—4th century A.D.). This expedition also dug near Kerch at Nymphaeum, the site of an Hellenic city attributed to the 4th or 5th century before our era. Two hundred miles northeast of Tashkent the site of Tarāz has been identified by A. N. Bernstam in the southern part of Kazakhstan. The ruins of this city of the first millennium A.D., mentioned by Byzantine, Chinese, Turkish, and Arabian writers, were found quite unexpectedly in the centre of Dzhambul, near the Uzbek frontier.

(h) *Afghanistan*.—A reconnaissance expedition sent out by the Victoria and Albert museum and the Royal Geographical Society under the leadership of Evert Barger to the Plain of Bactria in the Oxus valley has discovered important Greek remains at Kunduz. A large number of mounds were mapped and much valuable data secured, including Greek and Sassanid seals and coins.

(i) *India*.—Although very little actual excavation was done in India during the past year great significance may be attached to the survey of the present state of research in that country conducted by Sir Leonard Woolley. Woolley's report, which has just been published, contains recommendations which it is hoped will give new impetus to the Archaeological Survey of India. In the meantime, the India Society, London, published during the past year an excellent summary covering the historical periods, entitled *Revealing India's Past*. The book is written by 22 authorities and is edited by Sir John Cumming, Vice-Chairman of the School of Oriental Studies.

(j) *Malaya*.—The expedition of the Greater-India Research Committee under the direction of H. G. Quaritch Wales has been doing excavations of the utmost importance in Malaya, where no systematic work has ever been done on the archaeology of the Hindu period. Over 30 sites, most of them in Kedah, were dug and evidence was obtained suggesting that Buddhism was introduced in Southeastern Asia more than a century earlier than was hitherto suspected. In the remains of ruined Shiva temples, dating from the 4th to the 13th centuries A.D., much valuable information was secured. This contributes to the problem of the cultural expansion of ancient India which culminated in the flowering of the Indo-Javanese and Khmer civilizations of the Far East.

(k) *China*.—In spite of military activities the research work of *Academia Sinica* on the remains found at Anyang has continued at the expedition's new headquarters in Yunnan. Anyang has yielded extremely important Bronze Age material dating from the Late Shang period (1300–1100 B.C.). Near the city of Ch'ang-sha. Hunan Province, John H. Cox of Yale-in-China has made startling discoveries in cemeteries containing burials of the Late Chou, Han, and Six Dynasties periods (6th century B.C.—6th century

A.D.). The material adds enormously to archaeological knowledge of the Yangtse valley and demonstrates what has long been suspected—the presence of a high civilization in that region at an early period.

BIBLIOGRAPHY.—Except where otherwise stated, further information concerning many of the most important discoveries mentioned above may be obtained by consulting the 1939 numbers of *The Illustrated London News*, *Asia*, and *Antiquity*.
(H. L. Ms.)

Archery. At the 59th annual tournament of the National Archery Association, which was held in St. Paul, Minn., July 17–22, 1939, Pat Chambers of Portland, Ore., successfully defended his championship title and set up a record of 134–826 in the Single York round. Mrs. Belvia Carter of Seattle, Wash., won the ladies' title by a narrow margin over Miss Jean Tenney of Clear Spring, Md., the defending champion; but during the tournament, Miss Tenney set up a new record of 72–492 in the Single National round. A new record in the Single Columbia round of 72–552 was established by Mrs. Beatrice Hodgson of San Pedro, Calif. In the flight shooting, Curtis L. Hill of Dayton, O., made a record of 517yd., 1ft., and Mrs. Millie Hill of Dayton, O., set up a record of 374yd., 2ft., 5 inches.

During 1939 there was a marked increase of interest in field archery as distinguished from target archery. Field archery associations have been organized in several States, and the organization of a national field archery association is well under way. In May 1939, the National Archery Association sponsored the 10th Annual Women's Intercollegiate Telegraphic Archery Tournament which was participated in by over 1,000 students from 99 colleges. This event was won by Team No. 1 from Los Angeles City college. One of the spectacular archery events of 1939 was the shooting of an arrow 896yd. by Ken Wilhelm of Yermo, Calif. This was done in the so-called "free style," lying on his back with the bow strapped to his feet and using both hands to draw the string. With the bow held in his hand and shooting in regular form, Mr. Wilhelm made a shot of 579.7 yards.

(L. C. S.)

Architecture. The beginning of another war in Europe in the fall of 1939 arrested normal architectural development on the Continent and in England. Up to that point conflicting social and political aims had left their stamp on architecture. In countries where the right to freedom of thought prevailed progress in design was more pronounced than in the totalitarian States where the appearance of buildings was dictated by Government regulation or suggested through examples of national style characteristics. Depressed economic conditions restricted the activities of private building and caused the continuance of Government building programs aimed at the stimulation of employment. For this reason much of the architecture and the trend of architectural development had to be attributed to Governmental bureaus instead of to individuals. Some countries dedicated their building programs to social measures, such as housing, clinics, recreation camps, playgrounds, etc., while in other countries they gave expression to the glorification of national ideals. With the advent of the war, civic building lapsed and military architecture increased. The effect of air raids on buildings and on centres of populations became of architectural importance. The ingeniously constructed defence lines on the borders of Germany and France stood their first test. While Europe settled down to warfare, opportunity for leadership in architectural development shifted to the United States. European architectural influence, however, still continued indirectly through the work of European architects who came to America during the period of social unrest preceding the war.

Modern Architecture.—The motive behind modern architec-

ture was a liberation from the restrictions and formalities of the patterns of the past. The two principal schools of modern architectural thought, which were separated by a difference in the interpretation of this new freedom, drew closer together. Architects who stood for the scientific reasoning of functionalism as a basis of design were approaching the theories of modernists who set beauty of forms as their aim. In 1939 less influence came from Le Corbusier whose writings constitute the major background of functionalism. Frank Lloyd Wright who represented the other school of thought gave a series of lectures in London which counteracted the influence of the functionalist on the minds of the younger men in England. The premise both schools had in common was characterized by precedence of the considerations of space over mass, open planning for a flexible use of interiors, the absence of symmetry, a lighter appearance of construction, and a greater use of glass. The barrier which remained was the difference in interpretation of decoration in architectural design. Functionalists opposed the use of ornament, while Frank Lloyd Wright and his followers often resorted to it as a means of giving interest to architectural surfaces. Towards the end of the fourth decade of the 20th century, functionalists tended to pay greater attention to surface treatment by the increased use of curves, breaks, and varied textures. The contributions to functional architecture by individual designers who have given their personal interpretation to the original theories, contributed greater aspects of individuality and more personal characteristics than were found in the earlier form of functionalism, known as International Style.

Traditional Architecture.—Sentiment for the past and long association continued to give traditional architecture a strong hold. Forms were simplified to fall in line with the modern trend but the general characteristics remained; adherence to the basic patterns of the past, a leaning toward symmetry in plan and elevation, an effect of solidity, openings of vertical proportions, mouldings and applied decoration. While native domestic architectural styles for residences furnished the design prototypes, the formulae deduced from classic architecture combined with the teachings of the academies, governed the design of the more prominent buildings in most countries. Wherever a country established a national architecture it was found expedient to use a style of classic derivation. This was seen in previous years in Russia and Germany, and in 1938 in Italy.

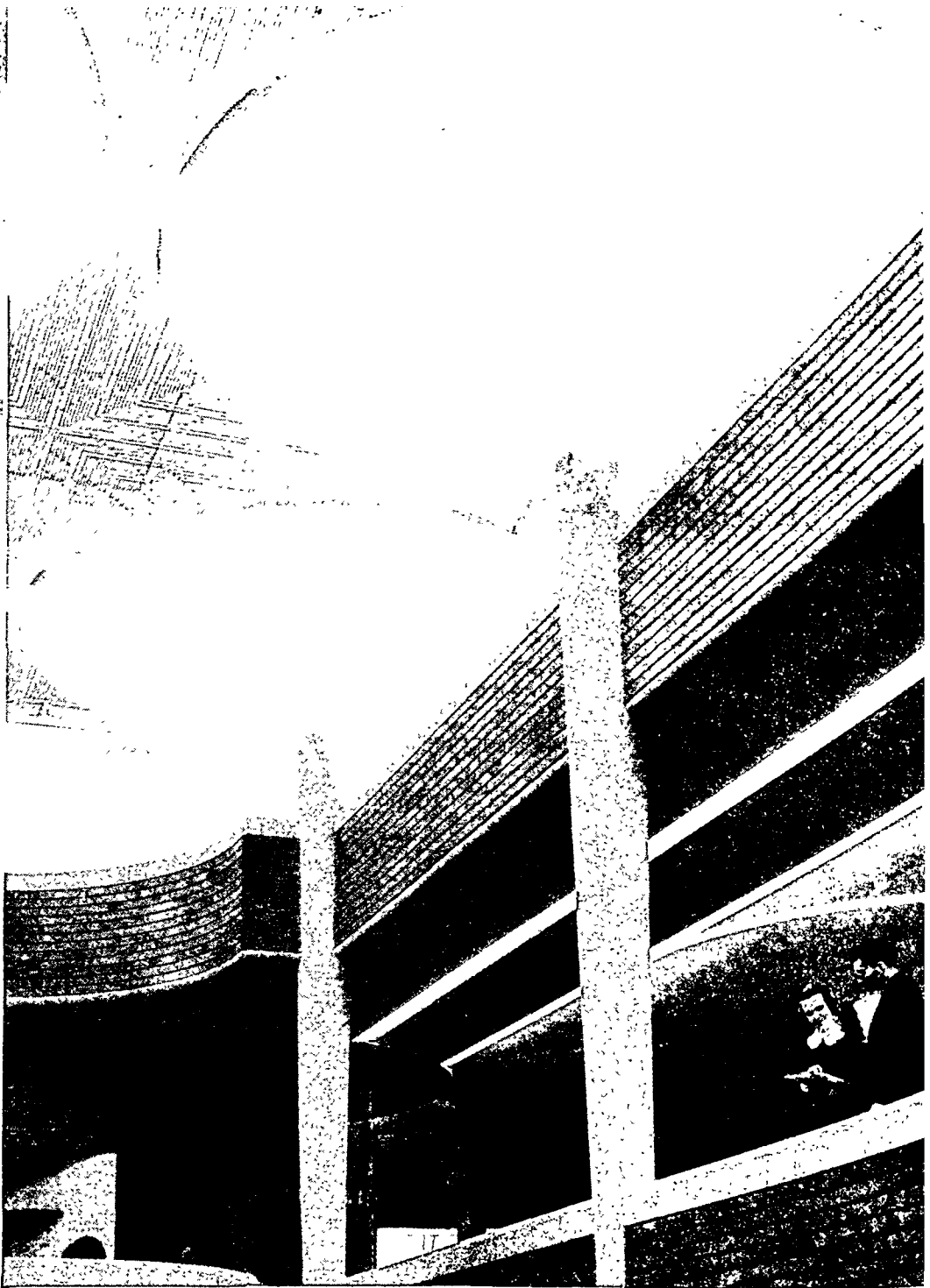
Materials, Methods, Construction.—As labour costs rose synthetic materials were found as substitutes for the costlier types of materials. In residential work dry construction gained in use. This method eliminated plastering and thereby saved the time and heat necessary to dry out buildings as well as the finish which has to be installed to cover wood exposed to damage by plasterers. There was a greater awareness of the difficulties entailed in the pre-fabrication of complete houses, but the use and manufacture of pre-fabricated parts of buildings increased. Plywood underwent further developments; it became a well established surface material and its structural uses were extended. In the field of building equipment many new devices appeared on the market. There was a tendency to recognize the value of heating systems which had lower temperatures at the source of heat in the rooms. Isolated experiments with panel heating by warming floors or ceilings continued in the United States. Fluorescent lamps found ready acceptance in the same country and new types of light fixtures were developed and manufactured for their use. A polaroid lamp was also made available for diminishing eye strain due to reflections.

Examples of Recent Architecture.—Functional architecture brought to England by architects from the Continent continued to exert its influence on the architectural development of that

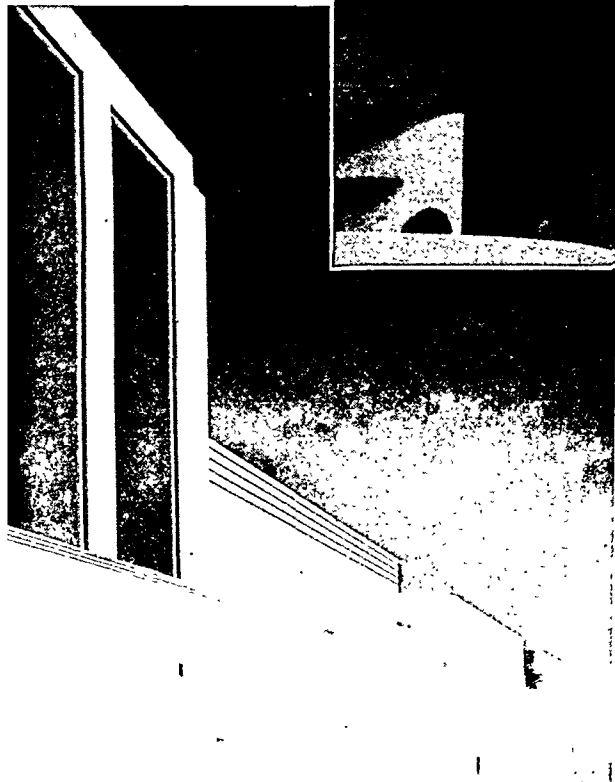


Above: THE ONLY "MODERN-ISTIC" CATHOLIC CHURCH in America—St. Austin Church in Minneapolis—was dedicated in 1939

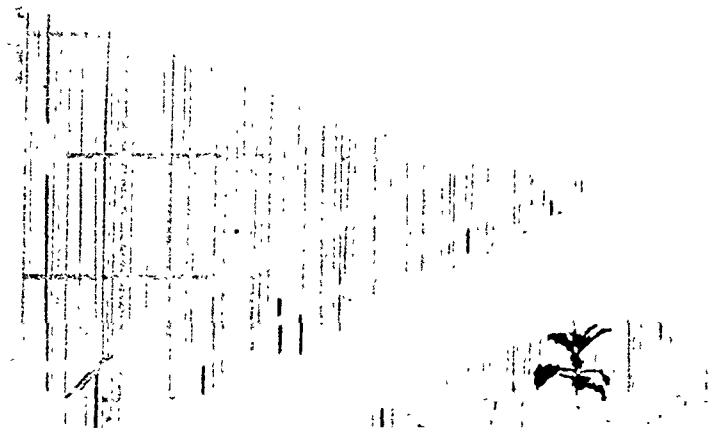
Right: INTERIOR OF OFFICE BUILDING designed by Frank Lloyd Wright for S. C. Johnson & Son in Racine, Wis., completed in 1939



Below: EXTERIOR OF NEW NBC broadcasting studios, Hollywood, California



Below: MAIN STAIRWAY of the Museum of Modern Art, opened May 10, 1939, in New York city; Philip L. Goodwin and Edward D. Stone, architects



country. It caused a simplification of the traditional styles which were still chosen for the larger portion of buildings. The newer flats showed the usual modern design elements: windows in horizontal bands and the predominance of openings over masonry. In functional designs there was a greater tendency to use projecting surfaces, as for instance, at the Highgate flats (Tecton, architects). The penthouse which was later completed on the second flat known as Highpoint No. 2 followed in the use of curved surfaces a newer modern trend. The Health Centre for the Borough of Finsbury by the same architects showed the part architecture has played in the organization of social services. The building was designed to co-ordinate medical clinics and offices and to offer lectures on subjects affecting public health and welfare. Many of the larger residences followed functional architecture. The house near Halland in Sussex by Serge Chermayeff, architect, used as its principal façade facing the garden and the sun, a concrete grid with glass in large sheets between the columns and beams. A house in Esher, Surrey (Patrick Gwynne and Wells Coates, architects) followed a principle first advocated by Le Corbusier; the main mass of the building was elevated on posts. An opportunity for the expression of a modern social need was given to Walter Gropius and Maxwell Fry in the Impington Village college of Cambridgeshire. This building functioned as a centre of the cultural and social life of a rural region and offered educational facilities for young and old.

For official architecture, England preferred traditional designs as seen by the new Government building of Edinburgh (Thomas S. Tait, architect) and the Town Hall at Wolverhampton (E. D. Lyons and L. Israel, architects). The new hospital at Chichester (C. G. Stillman, architect) resorted to the rambling open plan instead of the multistoried type which supplanted open schemes elsewhere in the interest of efficiency of circulation and service. In France, the strong position of the Ecole des Beaux-Arts stifled the growth of modern architecture. The continuing influence of this academy can be seen in the typical official architecture as exemplified by the Museum of Public Works (A. and G. Perret, architects), in the French Legation at Belgrade (R. H. Expert, architect), as well as in the French Pavilion at the New York World's Fair by the same architect. In general a fondness for motives of classic derivation and applied decoration prevailed.

Modern architecture found its expression more in writings and theoretical designs than in executed buildings. To the well-known publication of Le Corbusier must be added the studies of Paul Nelson for a "Suspended House" and a science museum "Palais des Découvertes."

The League of Nations Building in Geneva, Switzerland, exemplified the force of influence French thought played in its design. In adhering to the patterns of French academic design, it stood in contrast to the functional architecture which found wide following in the German section of Switzerland.

Sweden and Finland, since the war of 1914-18, have held an important position in the field of modern architecture. The Building Trades building in Stockholm exemplified the modern characteristics of the work of Sven Markelius who contributed much to the movement of modern Swedish architecture from the neo-classic style to functionalism. The Swedish Pavilion at the New York World's Fair by the same architect held throughout its design one of the most distinguished positions among the exhibition buildings.

The work of Alvar Aalto of Finland as seen in the Gullichsen House near Pori, brought modern architecture to a higher point of development; it produced the balanced combination of reason and emotion as guiding forces to design.

In Italy the aim of the Italian architecture was not solely the glorification of the State but more the benefit of the people. The

vacation homes at Tirrenia (Paniconi and Pediconi, architects), at Cesenatico (G. Vaccaro, architect), and at Bardonecchia (G. Levi Montalcini, architect) show that architects still had sufficient freedom to express similar problems in different ways even though efforts to establish an Italian national style were apparent in the official buildings.

Germany continued to develop gigantic projects which aimed to express the ideals of National Socialism. An official style was established for this purpose; buildings showed a stamp of uniformity which resulted from Government regulations for design and work carried out by large bureaus instead of individual architects. Designs for the rebuilding of Berlin were well under way. The main avenue proposed as a new North-South axis of the city was to provide sites for ambitiously conceived Government buildings at several round points located at the intersections with principal streets. A circle of huge buildings which neared completion before the beginning of the war in 1939, formed the terminating feature of the axis and an imposing gateway to the city. In Munich the Königplatz was reshaped and plans completed for the rebuilding of the Odeonplatz and the construction of a new opera house seating 2,600 spectators.

In Russia, the Club of Moscow (Molotov and Tchekmotaieff, architects) showed like most Russian architecture of the end of the 1930s a fondness for classic pomp. There has been a vogue for erecting gigantic statues on the top of buildings which started at the Palace of the Soviets (Iofan, Stchovko, and Helfreich, architects) and continued on some official buildings in Moscow as well as on the Russian Pavilions at the Expositions of Paris, 1937, and New York, 1939.

A competition was held in Turkey for a new Parliament building at Ankara. The winning design by the Austrian architect, Clemens Holzmeister, repeated the use of simple forms seen in the palace for the President of Turkey by the same architect. It stood in contrast to a design by J. Vago in which elements of Byzantine and Moslem architecture were featured.

The direction of architectural development in the United States still remained undefined at the end of 1939. The New York World's Fair and the San Francisco Golden Gate International Exposition brought out the influence of business and industry on American architecture. The profusion of commercial exhibits in the New York Fair showed the role that advertising and mass consumption played in the shaping of architecture. The foreign pavilions expressed the national characteristics of the countries they represented.

The large volume of building carried on by the Government or coming under governmental control tended to perpetuate traditionalism. The Procurement Division of the Department of the Treasury was responsible for the architecture of many imposing post offices, court houses and Federal buildings throughout the United States. The Tennessee Valley Authority completed dams and power houses which combined a straight-forward simple expression of functional needs with the use of classic proportions.

To individuals and group of individuals belonged the credit for furthering modern aims. While the houses of Frank Lloyd Wright continued to show the characteristics of a modern architecture which has grown on American soil, the houses of William Lescage, Richard Neutra, and Walter Gropius were in form and spirit expressions of functionalism imported from Europe. The new building for the Museum of Modern Art in New York (E. Stone and P. Goodwin, architects), showed the best of functional theories applied to American conditions. The work of students in architectural schools and primarily the designs submitted in competitions indicated a more general acceptance of modernism by the younger men. The design submitted by Eliel and Eero Saarinen. J. Robert F. Swanson, associates, in a competition for the Smith-

sonian Institute at Washington in its very modernism stood in contrast to the traditional architecture seen heretofore in the Government buildings. Likewise the winning design by Eliel and Eero Saarinen, J. Robert F. Swanson, associates, for a proposed School of Fine Arts and Festival Theatre at Williamsburg, Va., indicated a growing acceptance of modernism.

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(W. F. B.)

Arctic Exploration: see EXPLORATION AND DISCOVERY.

Areas and Populations of the Countries

of the World. The table that follows gives the latest known figures of the area in square miles, the population in thousands and the population per square mile of the different countries of the world.

Name of State	Area (in Square Miles)	Population (ooo's omitted)	Population per Square Mile
Afghanistan	250,900	10,000	27.9
Albania	10,800	1,120	103.7
Andorra	191	5	26.2
Argentina	1,079,965	12,958	12.0
Australia, Commonwealth of	2,974,581	6,930	2.3
Belgian colonial empire	922,950	13,937	15.1
Belgium	11,775	8,386	712.2
Bohemia-Moravia (Protectorate) as of March 1939	18,914	6,794	359.2
Bolivia	506,818	3,300	6.5
Brazil	3,285,319	44,116	13.4
British colonial empire	4,012,396	71,433	17.8
Bulgaria	39,825	6,371	160.0
Burma	261,610	15,797	60.4
Canada	3,729,665	11,209	3.0
Chile	286,396	4,635	16.2
China, total	4,480,992	457,836	102.2
China Proper	2,993,475	422,708	145.6
Manchuria	482,440	29,328	60.8
Mongolia	625,783	2,078	3.3
Tibet	469,294	3,722	7.9
Colombia	448,794	8,725	19.2
Costa Rica	23,160	623	26.9
Cuba	44,144	4,200	95.1
Danzig (as of Dec. 31, 1937)	754	405	537.1
Denmark (exclusive of Greenland) Dominican Republic	17,115 19,325	3,793 1,587	221.6 82.1
Ecuador (excl. of uninhabited terri- tory)	175,630	2,757	9.9
Egypt (excl. of uninhabited terri- tory)	383,000	16,030	41.9
Estonia	18,353	1,134	61.8
Finland	147,811	3,630	24.6
France	212,659	41,980	197.4
French colonial empire	4,657,359	70,147	15.1
Germany (as of March 1939)	226,196	78,953	349.0
Great Britain and Northern Ire- land, United Kingdom of	94,633	47,630	503.3
Greece	50,184	7,107	141.6
Guatemala	45,452	3,045	67.0
Haiti	10,204	2,600	254.8
Honduras	46,332	1,000	21.6
Hungary (as of October 1938)	40,530	10,111	249.5
Iceland	39,709	118	3.0
India (exclusive of Burma)	1,547,069	362,000	234.0
Iran (Persia)	628,000	15,000	23.9
Iraq	116,600	3,670	31.5
Ireland	26,601	2,937	110.4
Italian colonial empire	1,345,000	8,597	6.4
Italy	119,764	43,509	363.3
Japan	147,611	72,223	489.3
Japanese empire	115,321	31,288	271.3
Latvia	25,395	1,981	78.0
Liberia	46,000	2,500	54.3
Liechtenstein	65	12	184.6
Lithuania (exclusive of Memel)	20,458	2,575	125.9
Luxemburg	1,000	301	301.0
Mexico	763,944	19,479	25.5
Monaco		24	40,678.0

Name of State	Area (in Square Miles)	Population (ooo's omitted)	Population per Square Mile
Netherlands	13,203	8,727	661.0
Netherlands colonial empire	789,962	67,666	85.7
New Zealand	104,751	1,604	15.3
Nicaragua	49,200	1,134	23.0
Norway (including Svalbard)	148,850	2,922	19.6
Oman	80,000	500	6.3
Panama (exclusive of Canal Zone) Paraguay	28,500 176,788	548 950	19.2 5.4
Peru (revised areas)	482,258	7,100	14.7
Poland	150,820	34,774	230.6
Portugal (incl. Azores and Madeira Isles)	36,802	7,460	202.7
Portuguese colonial empire	810,200	9,405	11.6
Rumania	113,884	19,852	174.3
Salvador	13,176	1,704	129.3
San Marino	38	14	368.4
Saudi Arabia	800,000	4,500	5.6
South Africa, Union of	472,550	9,889	20.4
Spain	196,607	25,000	127.2
Spanish colonial empire	128,696	1,005	7.8
Sweden	173,347	6,310	36.4
Switzerland	15,944	4,210	264.0
Thailand (Siam)	200,148	14,650	73.2
Turkey	295,000	16,800	56.9
United States	3,026,789	130,215	43.0
United States territories and pos- sessions	711,606	16,069	22.6
Uruguay	72,153	2,120	29.4
U.S.S.R.	8,167,559	170,467	20.9
Vatican City		1	5,882.4
Venezuela	352,051	3,530	10.0
Yemen	75,000	3,500	46.7
Yugoslavia	95,558	15,630	163.6
World Totals	51,258,710	2,161,629	41.6

Argentina, second largest country in South America, a re- public on the Atlantic coast of Southern South America; language, Spanish; capital, Buenos Aires; president, Dr. Roberto M. Ortiz.

Area and Population.—The area is 1,079,965 sq.mi., slightly over a third of that of the United States. No official census has been taken since 1914, but the population was officially estimated (Dec. 31, 1938) as 12,958,217 (an increase of 196,708 in the year, of which 20% was by immigration). Native-born of European stock total 76.9%, mixed blood 3.2%; foreign-born (practically entirely Europeans), 19.9%. The percentage of white population is greater than in any other American country except Canada. The bulk of the population is of Spanish blood, with an important Italian element estimated at one-third. Nearly 250,000 persons are of German birth or parentage. The chief cities (with officially estimated populations) are: Buenos Aires, 2,345,221 (3,666,585 with its suburbs); Rosario, 511,411; Avellaneda (a suburb of Buenos Aires), 233,950; Córdoba, 213,208; La Plata, 192,225; Tucumán, 146,641; Santa Fé, 145,758; Bahía Blanca, 109,660; Mendoza, 82,277; Paraná, 72,288. Twenty-seven other cities have populations in excess of 25,000.

History.—The Government is Federal in form, with legislative powers vested in a congress. During 1939, the administration of President Ortiz continued its strong stand for democracy and against non-American entanglements, and carried out a program emphasizing public works, social betterment (especially education), and the development of a greater national self-sufficiency. Some recovery was made from the depression of 1938, due to larger agricultural production and, late in the year, to the increased demand and somewhat higher prices for raw materials as a result of European war.

International relations were conducted vigorously by Foreign Minister José María Cantilo. After declaring neutrality in the European war, Argentina participated in the Panama Conference, and assumed leadership in the expulsion of Russia from the League of Nations in December. The engagement of the German pocket-battleship "Graf Spee" with three British cruisers off the coast of Uruguay and the subsequent flight of its crew to Argentina waters after they had scuttled the ship, involved her in diplomatic interchanges with Germany, who protested the internment of the

"Spee's" men. (See HISPANIC AMERICA AND THE EUROPEAN WAR.)

Early in April, publication of documents purporting to reveal German designs on scantily populated Argentine Patagonia led to a Government investigation of the Argentine Nazi party and other German-influenced groups. The Government then issued a decree (May 15) outlawing all organizations with foreign political leadership or financial support. Italian fascist organizations and the Spanish Falangists, as well as the Nazis, were affected.

Foreign trade problems were one of Argentina's major concerns in 1939. As a result of the large excess of imports over exports in 1938, a rigid import control policy was adopted in Feb. 1939, designed especially to limit imports from countries selling more in Argentina than they bought. Despite official espousal of a multi-lateral trade system as Argentina's ultimate goal, the Ortiz administration continued its previous policy of bilateral trade treaties. During the year's course, barter agreements with Germany and Italy, an exchange agreement with Brazil, commercial treaties with Denmark and Spain, and "most-favoured-nation" agreements with France and Norway were made. In November formal negotiations were begun with the United States for a reciprocal trade agreement to end the long period of chaotic trade relations between the two countries, and were still in course at the close of the year. The highly competitive nature of Argentina's leading exports, coupled with the imminence of presidential elections in the United States, made the outcome quite doubtful, however. Meanwhile, exchange and import restrictions against United States products, whose quota had been cut 40% in February, were materially relaxed in some respects when European war threatened to cut off Argentina's normal sources of supply. Nevertheless, Government emphasis was placed on purchases from Great Britain and France.

Politically, the feature of the year was President Ortiz's campaign for clean elections, which brought him into sharp conflict with the conservative political factions which had elected him. Federal intervention (a presidential prerogative) in San Juan and Santiago del Estero provinces earlier in the year was followed in December by President Ortiz's demand that the governor of Catamarca annul fraudulent provincial elections which the conservatives had won. A major political crisis loomed when the vice-president and three members of the Ortiz cabinet supported the governor. The crisis was expected to reach its peak with the convening of the Catamarca legislature on Jan. 3, 1940.

The national public works program was continued through 1939, with an authorized expenditure of 200,000,000 pesos in addition to the extensive highway-construction program (financed by the imposition of new and the increase of old automotive fuel taxes). Purchase of the Córdoba Central and the TransAndine railways by the Government was consummated during 1939 after several years of negotiations. The prices were £10,000,000 and £750,000, respectively.

Education.—Culturally, Argentina is one of the most advanced of all Hispanic American countries. Education, gratuitous and obligatory between the ages of 6 and 14, is in the hands of the national and provincial Governments. There are over 12,000 elementary schools, with over 1,750,000 pupils (5,100, with over 830,000 enrolment, are nationally supported). Public secondary schools number 258, with 106,000 enrolment. In addition there are numerous private schools (elementary and secondary). Their curriculum is under Federal supervision. There are six national universities, including the University of Cuyo, established in March 1939, and one private university, with a grand total of over 25,000 students. The national universities of Buenos Aires and La Plata have high international standing.

Army and Navy.—The Argentine Army includes an active force of 30,713 men and a trained reserve of 448,383. Military or

naval service is compulsory. The Navy is the largest in South America. Naval personnel totals 20,265, including 5,000 conscripts. The air strength is in excess of 250 planes.

Finance.—The monetary unit is the peso, valued (Dec. 1939) at 22.7¢ U.S. (Unofficial rate.) Until the outbreak of the European war the official rate was maintained at 17 pesos to the pound. With the decline of the pound in terms of dollars, the rate was readjusted (September 12). The 1939 budget, which provided expenditures of 1,094,000,000 pesos and estimated income at 726,000,000 pesos (actual revenues: 876,512,000 pesos), was continued for 1940. Profits from exchange control and bond issues were expected to cover the deficit.

Trade and Communication.—In 1937 Argentina's exports totalled 2,310,997,802 pesos (agricultural products, mostly cereals, 64.5%; livestock products, largely meat, 31.4%; forest products, 2%). In 1938 exports were 39% less, or 1,400,294,000 pesos (agricultural products, 47.44%; livestock, 45.6%; forest products, 2.95%), taken principally by Great Britain, 32.8% (29.1% in 1937), Germany, 11.7% (6.8% in 1937), and the United States, 8.5% (12.8% in 1937). The Netherlands and Belgium took 7.5% and 7.2%, respectively. Imports (principally textiles, petroleum products, machinery, and miscellaneous manufactured goods), were 1,419,438,441 pesos, a 6.3% decline, and came chiefly from Great Britain (18.3%), United States (17.7%), Germany (10.1%), Italy (5.5%), Belgium (5.2%), and France (4.3%). In the first 11 months of 1939, imports were 9.8% less, totalling 1,195,828,656 pesos (Great Britain, 20.1%; United States, 16.4%; Germany, 9.9%; Belgium, 6.7%; Brazil, 6.3%; France 6.0%). Exports aggregated 1,417,543,467 pesos, an 11% increase (Great Britain, 34.0%; United States, 11.3%; Netherlands, 7.2%; Belgium, 6.4%; Germany, 6.3%). After September, German trade was all but non-existent.

By far the greater part of Argentine external commerce is handled through Buenos Aires, which is served by numerous steamship lines and is the hub of the country's intricate railway system. Bahía Blanca to the south and Rosario on the Paraná are also important. Comodoro Rivadavia, in southern Patagonia, is the centre of the growing oil industry. Railway connections link the country with Chile, Bolivia, Paraguay, and Uruguay. Excellent air communication provides transport to all parts of America. Regular service was maintained with Germany until Sept. 1939.

In 1937 there were 377,473 telephones in the country (over half of them in Buenos Aires), 47.49% of the grand total for all South America. The Government-owned telegraph lines are 140,000 mi. in length. Over 40 radio stations, including one short-wave, are in operation.

Argentina has approximately 43% of South American railroad mileage and ranks sixth in the world, with 45,651 km. in 1939. The highway system totals 308,248 km., of which 16,565 km. is paved road. Over 55,000 km. is under national control. The national highway program of 1932 was rapidly pushed during 1939. By late 1939, the principal highways constructed or under construction were: Buenos Aires to southern Argentina, 1,920 mi. (practically complete as far as Bahía Blanca, 397 mi.); Buenos Aires-Mar del Plata, 240 mi.; Buenos Aires-Mendoza, 660 mi. (approximately two-thirds complete); Buenos Aires-La Quiaca (the Bolivian frontier), 1,260 mi. (720 mi. completed); and the North-South highway (the most ambitious of all the road projects, extending from Los Andes in the extreme north to Santa Cruz in the far south, and paralleling the base of the Andes), 2,811 mi. (1,428 mi. completed). This network, when completed, will connect with the Inter-American highway system. An annual expenditure of 100,000,000 pesos, half of which is derived from gasoline taxes, is being made for national and provincial highway systems.

Agriculture and Livestock.—Argentina's resources are primarily agricultural and pastoral, with 10.8% (74,130,000ac.) and 44.4% (306,404,000ac.) respectively of the entire area of the country devoted to them. The chief agricultural products are cereals and linseed. Except for maize (5,400,000 metric tons), production in 1938–39 was generally good. Wheat (9,150,000 metric tons) was second to the all-time high of 1929, and Argentina ranked fourth in world production. Crop estimates for 1939–40, however, were 4,000,000 tons, against a ten-year average of 6,245,000 tons, and with good crops elsewhere, Argentina was expected to rank seventh. Linseed, in whose production Argentina leads the world, was estimated at 1,250,000 tons, 11.4% less than 1938–39 (1929–39 average, 1,714,000 tons). Other important crops, with 1939–40 estimated tonnage (1929–39 average in parenthesis) are: oats, 900,000 (842,000); barley, 750,000 (514,000); rye, 360,000 (210,000); birdseed, 32,000 (30,000). Cereal exports during 1939 exceeded those of 1938 by an excess of 70% in volume, but low prices held the value increase to less than 20%. Wheat, selling at the lowest price in three centuries, was heavily exported, with a total of nearly 5,000,000 metric tons in the 12-month period ending Nov. 30, 1939.

Other important agricultural products are cotton, sugar, wine-grapes, and peanuts. In 1938–39, 412,000 hectares were in cotton, with a production of 70,891 tons. Sugarcane production, largely in Tucumán province, was 5,321,979 metric tons. Fruits are extensively produced in Mendoza, along the eastern slope of the Andes, and in Patagonia. In 1938, 32,924 tons of fruits were exported, pears constituting over half. In the first ten months of 1939, fresh fruit exports rose sharply, to 52,568 tons (pears 53%, apples 22%).

Agriculture and livestock together account for 95% of the exports. The livestock census of 1937 showed a total of 43,790,166 sheep, 33,100,152 beef cattle, 8,527,181 horses, 4,875,990 goats, 3,975,716 hogs, 905,041 mules and asses, along with 43,285,211 poultry, 414,296 rabbits, and 262,322 beehives. Beef and mutton, in canned and chilled form, constitute a leading export. War demands caused a heavy increase in exportation in the last months of 1939, with a single British Government contract calling for 200,000 tons of beef.

The fishing industry, although still small, is rapidly expanding.

Mineral and Forest Products.—Timber is very limited except in the subtropical north, where quebracho, source of tannin, has been extensively developed. Argentina produces two-thirds of the world's tannin supply. There are approximately 50,000 hectares of industrially valuable timber, principally quebracho. Argentina produces 60,000 metric tons annually of maté (Paraguay tea), 60% of the world supply, chiefly for domestic consumption, with 63,000 hectares under cultivation. There is very little mineral wealth other than petroleum. Argentina is 11th in world petroleum production, with a record output of 2,714,824 metric tons in 1938, and 1,450,178 tons in the first half of 1939 (8.46% increase). The principal fields are in southern Patagonia (near Comodoro Rivadavia), in Salta and Jujuy in the extreme northwest, and in Neuquén Territory. State owned fields account for slightly over half of all production, and all new fields are reserved by law for Government exploitation.

Manufacturing.—Manufacturing, although rapidly developing, is in no way adequate for the country's needs. In 1936 domestic consumption of goods reached 4,817,000,000 pesos value, of which 23.2% was imported, compared with 40% importation in the period 1910–13. The 1937 industrial census showed increases of 20 to 30% over 1935, with 50,689 industrial establishments, 733,651 employees, and an annual payroll of 1,001,113,000 pesos. Value of raw material used was 40% greater than in 1935 (2,880,523,000 pesos), the finished product 36% greater (4,708,379,000

pesos). Industrial activity is largely in foodstuffs and in the rapidly growing textile industry.

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Arizona. Arizona, one of the two youngest of the United States, was admitted with New Mexico in 1912; area, 113,956 sq.mi.; population according to the U.S. census of 1930, 435,573. After an intermediate decline the development of agriculture and renewed activity in mining have produced a conservative estimate of 450,000 in 1939. The capital is Phoenix, 48,118. Of the population 264,378 were native and foreign-born white, 10,749 coloured, and 160,446 other races, chiefly Mexican and Indian.

History.—The State officials, 1939, were chief justice, A. G. McAlister; governor, Robert T. Jones; secretary of State, Harry M. Moore; attorney general, Joe Conway; treasurer, William Peterson. The governor's promise of an efficient administration, together with his message advocating a revision of the taxing system to be devised by an impartial and out-of-State agency, roused favourable comment. The new administration, however, soon effected control of the political machine by gaining complete mastery of the highway department through a new organization over which the governor had absolute command. The governor's highway bill became a law mainly through support of the mining interests who feared the tax reform proposal of the administration. The latter never became a law. The governor gained more power through his proposed measure to remove control of liquor from the tax commission to a superintendent named by the governor. The change was favoured by liquor advocates who feared that further ineffective control might induce prohibition. The civil service bill, carefully prepared and ardently supported by advocates of the merit system, was again defeated. Also the strongly supported measure providing for retirement of public school teachers was defeated. The legislature provided for conditional ratification of the Santa Fe compact allocating the water of the Colorado river. To become effective this agreement must be approved by the legislatures of California and of Nevada as well as by Congress.

Charities.—In Oct. 1939 there were 37,977 cases or families receiving some form of public aid with a total monthly expenditure of \$667,253.79 which was 27% less than 1938.

Agriculture and Mining.—Citrus fruit, cotton, lettuce, and beef cattle comprise three-fourths of the value of agricultural products of Arizona. Arizona is sole producer of American-Egyptian or long staple cotton. In 1939 there were 188,000ac. of short staple and 41,000ac. of long staple cotton, a total increase of 10,000ac. over 1938. Arizona is the largest producer of sugar beet seed with 4,250ac. harvested in 1939. The grapefruit harvest was estimated at 2,500,000 boxes. Lettuce was produced from a total of 31,000 acres. Copper production for the last quarter of 1939 was at full capacity resulting in increased dividends and further expansion and totalling an excess over the 420,351,310lb. of 1938. The Magma Copper Company dividends increased \$1.25 per share in 1939. The Phelps Dodge Corporation had by Nov. 1939, removed from the Morenci open-pit mine over 15,000,000 tons of a planned total of 37,000,000 tons of overburden. (H. A. H.)

Arkansas, twenty-fifth State of the United States, popularly known as the "Bear State"; area, 53,335 sq.mi., population (U.S. census, 1930), 1,854,482; (estimate July 1, 1937), 2,048,000. Capital, Little Rock, 81,679; the next largest city is Fort Smith, 31,429. Hot Springs, a well known health resort, has 20,238. The rural population of the State (1930) was 1,471,604, or 79.4%. Of the total population 478,463 were Negroes, 10,173 foreign born. The State officials serving 1937–39

were re-elected in 1938 for another term of two years. They are: governor, Carl E. Bailey; lieutenant-governor, Bob Bailey; secretary of State, C. G. Hall; attorney-general, Jack Holt.

History.—In 1937 Governor Bailey persuaded the legislature to pass a civil service law which was the first in the South and which was regarded as an excellent law. The administration of the law the first year was good and this brought out vociferous opposition from the advocates of the old system with the result that the act was repealed. But fate was against the repealers, for the Federal administration of the security board compelled the selection of employees by the merit system. The auto test law was also repealed. The sales tax, which was enacted in 1935 as an emergency measure for the public schools, was now made permanent. The larger part is devoted to the public schools. An appropriation was made for a large annex to the State sanitarium for tuberculosis patients. The amendment authorizing the legislature to pass a workmen's compensation act was adopted in Nov. 1938. Such a law passed the legislature with the approval of employers and employees, but was opposed by many lawyers. The law provides for an "insurance plan" and abolishes the common law of "contributory negligence," "assumption of risk," and "fellow servants' negligence." A new election law provides for duplicate ballots and duplicate ballot boxes. Also a presidential preferential primary is authorized but is not likely to be used because the national convention is usually held before the State primary.

The governor suffered only one major defeat in his legislative program. He championed a bill to provide free text books for high schools (such a law was already in effect for the grades), but the schoolmen of the State rallied to the opposition and defeated it. In 1938 an amendment was adopted which prohibits any one appointed to fill a vacant office from becoming a candidate to fill that office at the next general election. The attorney-general has ruled that one cannot evade this provision by resigning from the office to which he has been appointed. The workmen's compensation act, the Refunding Act, and the act fixing the place of trial in cases growing out of suits for personal damages were all held up by the referendum. They are to be voted on Nov. 1940.

Education.—The enrolment in the public schools for 1938-39 was 478,324 or 13,052 higher than that of the preceding year. Most of this increase was in the grades, but NYA benefits helped to increase the high school enrolment also. Better tax collection gave a slightly larger sum to the schools, something over \$13,000,000. Three new buildings were erected at the University of Arkansas and some at several of the other State institutions. The future of the medical school, a part of the university, was assured by a contract with the city of Little Rock for the use of its hospital.

Banking and Finance.—The banking situation is sound. There was a slight decline in the number of State banks, which was due to liquidations, not to failures. The capitalization of the 50 national banks was unimpaired and their resources showed a healthy condition. The increase in bank clearings was notably large toward the close of 1939. The State debt of \$153,279,204.89 was reduced slightly. Tax collections were better and there was a small increase in assessed valuation.

Agriculture, Manufacturing, and Mining.—Cotton continued to be the leading crop. The estimated production for 1939 was slightly higher than in 1938, 1,410,000 bales, worth \$62,040,000; cottonseed, 627,000 tons, worth \$13,418,000; corn, 32,318,000bu., worth \$21,330,000; hay, 1,080,000 tons, worth \$8,532,000; rice, 8,721,000bu., worth \$6,628,000; potatoes (Irish and sweet), 5,683,000bu., worth \$4,580,000. There was a large increase in fruits, especially peaches, apples, and grapes, with a corresponding increase in value. The pecan crop was 3,543,000lb., worth \$315,000. The estimated farm value of 32 important crops was \$129,-

201,000 as compared with \$122,105,000 for 1938. A noteworthy development in industry occurred in 1939, about 100 new plants being developed. The largest of these was a \$750,000 gasoline extraction plant owned jointly by several producing companies in the Magnolia field. Several new oil wells were brought in and the total production was well over 1938's output. An increase in building activity called for more lumber and several new mills were opened in addition to the re-opening of many which had been closed. The demand for cedar posts was greater than the supply. Numerous quick-freeze and dehydrating plants responded to agriculture's demand for the preservation of its foodstuffs and feedstuffs. The outbreak of war in Europe stimulated the mining industry in several fields, notably zinc, manganese, and cinnabar. In the case of the latter the war simply caused imports virtually to cease, in consequence of which the price more than doubled. A production of 10 to 12 pounds of mercury to the ton is expected. The best fields are in Montgomery and Clark counties.

(D. Y. T.)

Armenian S.S.R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Armies of the World. Two highly successful campaigns in 1939 definitely set the latest type of army. The first was Franco's Catalonian campaign. The second was the German campaign in Poland. In both, skilful use of aviation, mechanization, and motorization in combination with the older type of infantry, field artillery, cavalry, and transport enabled swift and powerful blows to be given in such rapid succession that decisive victory for Franco and the Germans and defeat for the Catalonians and the Poles was the result.

Both campaigns proved that the power of aviation, mechanization, and motorization is not at its highest except when supporting the older arms. In other words, the new methods based on the gas engine do not replace the old but must be used in conjunction with them.

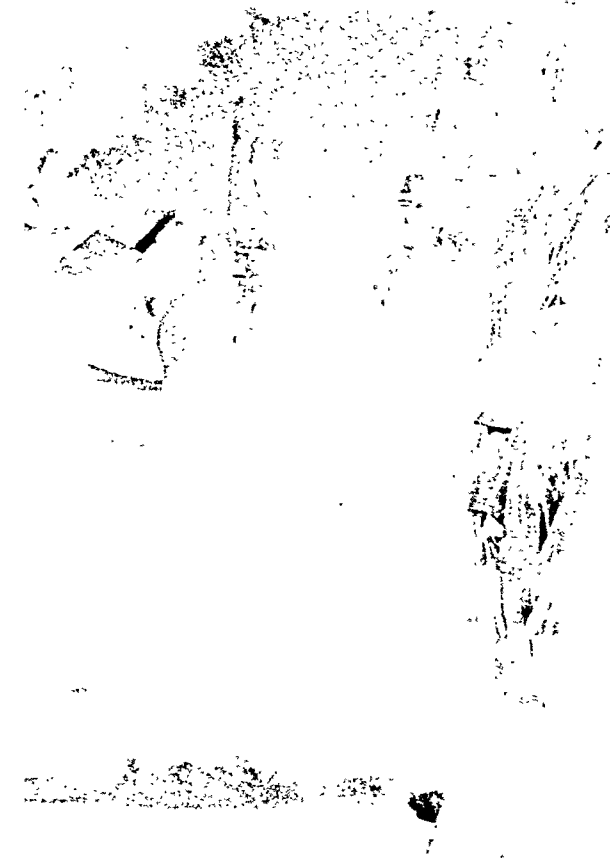
Lessons learned by the Germans in Spain were put into practice on a greatly increased scale in Poland. This because in battle on land and in the air in Spain, Germany was able to test tactical theories and armament evolved in peace and therefore possibly not correct in war.

The lessons learned in Spain by the Italians were the basis of the reorganization of their army. The quick conquest of Albania by Italy was possible because of these lessons. On a much smaller scale it was the same type of campaign as the subsequent German one in Poland.

The French Army, while fully aware of all these changes, considers the main problem for its home or Metropolitan army that of attack and defence on their limited, highly fortified on both sides, German frontier. The problem of war on the Italian frontier only differs in that the fighting would be in the Alps. It would still be a war on a narrow front along a frontier fortified on both sides, each backed up by a densely populated modern nation. The Alpine troops of various kinds maintained on this frontier are trained, equipped, and armed to handle the special problems resulting from mountain warfare both in summer and winter. The consequence is that the French Metropolitan army is trained, equipped, armed, and led to fight the heaviest kind of determined combat.

The Colonial army and the Army Corps of the Metropolitan army which comes from Algeria are trained, armed, and equipped to fight anywhere, with special emphasis on what is necessary to fight the natives of Africa and the Italian Army in Libya.

The British Regular Army is organized primarily to furnish a system of reliefs for the garrisons maintained overseas. Its equipment, armament, and training has been varied to suit the type



GERMAN TROOPS in bunkroom of Siegfried line

of war in which the greater part of it was engaged in at any time or expected to be engaged in next. Since the war of 1914-18 the belief in mechanization and motorization as the best means of meeting its varied problems has steadily grown. The Territorial Army, made up of volunteers and quite similar in many respects to the National Guard of the United States, was originally intended as a home defence force. However, in the war of 1914-18, it was used anywhere abroad needed. In 1939, it furnished the greater part of the anti-aircraft defence within Britain. It also is organized into a number of infantry divisions. Just before the outbreak of the European war its strength was doubled. Up to the end of 1939 its infantry divisions had not been sent abroad. The probabilities are that as the war continues they will be used anywhere British troops may be sent. In the World War, 1914-18, a third force called Kitchener's New Army was raised, at first by volunteering. Numerous new infantry divisions were organized from this force. They were available for service anywhere the Regulars could be used. In the World War Britain gradually came to conscription.

Shortly before the European war broke out, conscription was adopted in Britain. However, due to lack of training facilities, the majority of those registered were not called for service. The plan was to call 20,000 every two months for six months' training and service. Since the outbreak of war the calling up has been slightly speeded up. However, the majority are still (Jan. 1, 1940) only being registered, but not called for service. Up to the end of 1939 no new infantry divisions were organized from these conscripts.

The Spanish Civil War produced one more army and air force which must be taken into consideration in making any estimate of the European military situation. The Nationalist side came out of the war with a first class army of from 900,000 to 1,000,000 Spaniards and an air force of approximately 600 Spanish aviators. While the peace-time army of Spain is considerably below this

figure, it is an army well trained in modern combat, well led by experienced officers, and fairly well equipped and armed. The plans are to give it the most modern equipment and armament. Its leaders fully appreciate the strategical importance of the Spanish peninsula in all land, sea, and air military problems of Europe.

After considerable experimentation, the United States in 1939 decided upon a new type of infantry division for the Regular Army. Instead of the four infantry regiment division formerly standard the new division has three infantry regiments. The old division into two infantry and one artillery brigade is abolished, there now being no brigade organization. The National Guard Divisions are to keep the old organization of two brigades of infantry and one of artillery, each infantry brigade consisting of two regiments of infantry. The number of infantry support weapons, such as mortars, light machine guns, and anti-tank guns, is increased. The infantry is to be armed with the 30 calibre semi-automatic rifle instead of the old non-automatic rifle; 50 calibre machine guns have been added to the armament.

The total personnel of this division being smaller than that of the old, it can be transported more readily by motor transport. Despite this reduction in personnel, its total fire power of all types per infantry soldier is greater than the fire power per infantry soldier of the old division.

The Japanese Army, as a result of its campaign in China, has made two important changes in its organization. Like the United States Regular Army, it has changed its infantry division from a four-regiment one to a three-regiment one. It has considerably increased the amount of horsed cavalry.

Aeroplanes and Tanks.—During the World War the best type of weapons to be used against aeroplanes and tanks was not developed. Above all the necessary type of range finding and sighting apparatus did not exist. The backbone of the new German Army is the infantry. Each infantry division has, however, a far greater proportion of anti-aircraft and anti-tank weapons of all types as well as artillery than has ever before existed for the same number of infantry. It might be said that the infantry of a German division marches and fights surrounded on the ground and in the air by a hemisphere of fire. In fact, the development of fire by modern, well equipped, well trained, and well led infantry and artillery is so great that tanks need the assistance of this fire if they are to attack successfully.

In general the mission of aviation on land is:—first, when the opposing nations are close enough to make air raids, to delay mobilization and concentration of the enemy's army, and to destroy war factories and supply centres; and second, to use its great powers of surprise attack to aid its own army on the ground. While deliberate attacks on civilian population with the intent of breaking a nation's morale are possible, such use of an air force is generally considered, aside from humanitarian grounds, of far less military value than the two purposes given above.

Besides aviation and tanks, the motor has caused three other changes in armies. One is the partial substitution in the cavalry of armoured cars and light speedy tanks for horses for reconnaissance and cavalry screen (to check enemy's reconnaissance groups from getting information concerning main body of the army) work. Two is the substitution of tractors for horse teams to haul the heavier field artillery. Three is the transport of not only ammunition and supplies, but whole divisions complete by motor transportation. This motorization will permit even more drastic changes in strategy than those produced by the use of the railways on a large scale first in the American Civil War of 1861-65 and secondly by Von Moltke in 1870.

Germany considers the motor of such importance that she has appointed a dictator for the motor vehicle industry and decided that all motor vehicles manufactured will be built from the

point of view of their usefulness for war purposes.

Chemical Warfare.—Gas remains as during the World War a weapon of secondary importance. Up to the present there is nothing to justify the fear of its use to cause widespread destruction.

Specialists.—The constantly increased proportion of automatic weapons, of guns of all types, of mechanization and motorization and the considerable number of men on the ground needed to maintain planes in the air have greatly increased the proportion of specialists in all armies. In some countries the shortening of the term of service to 18 months or one year has had to be compensated for by an increase in the number of career or professional soldiers, if the training was not to deteriorate.

Military Service.—In all countries of any importance except the United States, the British Empire, and China, the army is raised by universal service. In the United States the armed forces are raised by voluntary enlistment. While Britain has adopted conscription, up to the end of 1939 the majority of her forces was raised from volunteers. In China the different generals raise their own forces. For some years General Chiang Kai-shek has been trying to insure uniformity of training and equipment and to bring all generals under control of the Central Government. He has been, however, only partially successful.

The length of active service in the universal service armies varies from 65 days for Swiss infantry, engineers, and foot artillery and but one month's training for probably 25% of the Russian army, to an average for most armies of two continuous years

THE FIRST BRITISH CONSCRIPTS, called up July 15, 1939, get their clothing supplies at Surrey barracks, Kingston



followed by various short periods from time to time while in the reserve. As the number of young men physically fit for military service each year in most countries exceeds the number which can be trained in the standing or active army, this excess is generally given short periods of training from time to time. This is particularly true in Russia. It is their basis for claiming a far larger number of trained reserves than those possessed by any other country. On the outbreak of war the trained reserves are used:—one, to bring the standing army to war strength; two, to mobilize new units made up of reservists; and three, to replace casualties. The British Army service includes both active and reserve service. The U.S. Army has begun to raise a reserve. Its strength is (Jan. 1, 1940) but 25,000 (approx.) and therefore insufficient to raise the Regular Army much less the National Guard to war strength. It has an Officers' Reserve Corps of 100,000 (approximately).

Germany's available trained reserves were considerably increased in 1939. First, because it was four years after she restored conscription. Second, because the annexation of Austria made available such men with military training as lived in Austria. Third, because the annexation of Czecho-Slovakia made available the reservists in those regions who had done their active service in the Czecho-Slovakian army.

In Italy, Germany, and Japan boys and young men are given a certain amount of training before they reach the age of military service. In the United States besides private and State military schools, there are limited courses of military training in a number of colleges and each year camps at which a relatively small number of boys receive one month's training without obligation of service. In Britain there are Reserve Officers' Training Corps in a number of schools. In the U.S. the National Guard, a volunteer civilian military force, is armed and equipped and partially trained by the National Government. In Great Britain there is a similar force called the Territorials.

In Germany, besides the professional army, there are partially trained Black Shirts (12,000 are well trained and equipped), Brown Shirts, Technical Emergency Help Corps, and a number of other Nazi-uniformed bodies. In Italy the Fascist militia which is partially trained has part of its force on active duty. In addition there are railway, port, forestry, highway, anti-aircraft, coast defence, and other militias.

Infantry.—The infantry division remains as during the war of 1914-18 the basic unit of all armies today. When that war broke out the standard type of infantry division consisted of two infantry brigades, each of two infantry regiments in turn composed of three battalions—of from 800-1,000 men. Each battalion was made up of four rifle companies. While the number varied somewhat, 36 field guns to 10,000-12,000 infantry or 1-33 guns per 1,000 infantry could be taken as an average proportion. During that war increasing difficulties in finding sufficient replacements for existing infantry units, coupled with the necessity of finding the personnel for the great increase in the proportion of machine guns to rifles, the introduction of automatic rifles, trench mortars, and anti-tank guns, all led to a reduction in the number of infantry soldiers in most of the infantry divisions of the French, British, and German armies. This was generally accomplished by reducing the division from four to three regiments and each regiment from three battalions of four companies each to three of three companies each. Thus instead of 48 companies of infantry a division had 27 companies—a net loss of 21. As a rule the artillery per division of infantry was not decreased, with the result that the proportion of artillery to infantry increased. As the amount of Army Corps (two or more infantry divisions to an Army Corps) and army (two or more Army Corps to an army) artillery steadily increased, as did the artillery directly under the

commanding general of each national army, the proportion of artillery to infantry was greatly increased.

Post-war developments have steadily tended to increase the proportion of automatic weapons and guns of all types which now include all types of mortars, anti-tank and anti-aircraft weapons as well as field guns and howitzers. Thus to prevent the infantry division from becoming too cumbersome to be handled as a unit by the commanding general, a reduction in the number of infantry riflemen had to be made. The U.S. army has begun to arm every rifleman with a shoulder automatic. This increase in fire power of the individual soldier permits a reduction in numbers in a unit without reducing the fire power of the unit. The increasing use of motor transport to move the division also made a reduction advisable. Various methods of reduction have been advocated. A continuation of the war division of three regiments of infantry each of three battalions of three companies each is one method. Infantry battalions of four companies each but with a lesser number of men per regiment is another.

France, Germany, Russia, and Japan have suppressed the infantry brigade. The United States has done so for its Regular Army but not for the National Guard. Each has three regiments of infantry to the division, except the U.S. National Guard Divisions which still have four. Great Britain from the days of the Cardwell reorganization has used a battalion instead of a regiment as the tactical unit. Four battalions grouped together constitute a brigade. It is commanded by a colonel with the temporary rank of brigadier general. Three of these brigades constitute an infantry division. Experiments as to infantry organization are being carried on in Britain. In Spain the usual organization for a division is three groups, generally called demi-brigades, each of four battalions. In practically all armies the infantry regiment is now of three battalions. In the U.S., French, German, Italian, and Russian armies there are three rifle companies to a battalion. In the British, Japanese, and Spanish armies there are four. A division of 10,500 is the strength in most countries. Germany has but 8,400.

Artillery.—The proportion of rifles and light and heavy machine guns per 1,000 infantry soldiers varies. Japan has the highest number of rifles, 628, and France the lowest, 277; Germany the highest number of light machine guns, 38.6; Russia the highest number of heavy machine guns, 15.8, and Japan the lowest, 6.5. Germany leads with by far the greatest number of close support weapons for the infantry; such as mortars, small calibre light guns, howitzers, anti-tank guns. Per infantry division the total is around 231. Most other countries average under 100. Russia has but 39. However, each Russian infantry regiment has 6-76-mm. field guns assigned to

it. This makes 18 guns in addition to the divisional artillery, or a total of 57.

The divisional artillery consists of one or more regiments of artillery except in the British army where there is no regimental tactical organization—the three battalions being organized into a brigade which is the equivalent of a regiment in other armies. Where there is more than one regiment the artillery is organized into a brigade. The regiments are of two to four battalions of two or three batteries each. Batteries are of three, four, or six guns, four being the more usual number.

The divisional artillery consists of both guns and howitzers. One of the questions under discussion in various armies is whether it is better to have only guns and light howitzers with the infantry division, the heavy howitzers being with the Army Corps artillery and sent to the divisions when needed, or to have the heavy howitzers an integral part of the divisional artillery. The light guns are around 3in. in calibre and the heavy from 4in. to 4.5 inches. The light howitzers are around 4in. or 4.5in. in calibre and the heavy around 6 inches. The number of artillery pieces per 1,000 men in the division varies from 2.46 in the Japanese army to 3.49 in the German army.

There are two new tendencies in the artillery armament of today. One is a tendency to increase the number of light weapons of less calibre than the 3-in. in close support of the infantry; that is, anti-tank guns, anti-aircraft guns, trench mortars, mountain guns, and light howitzers. This, while at the same time increasing the number of guns and howitzers of a greater calibre which lend more distant support than the range of those around 3-in. calibre

Military Forces of Nations of the World as of November 1, 1939

Nation	Armies			Air Forces			Total Land and Air	Air Force Separate or in Army
	Active	Trained Reserves	Total	Active	Trained Reserves	Total		
Argentina	49,705	282,503	332,208	2,023	.....	2,023	332,208	In Army
Belgium	600,000	242,000	842,000	7,500	.....	7,500	842,000	In Army
Bolivia	24,713	82,187	106,900	411	.....	411	106,900	In Army
Brazil	112,320	258,318	370,638	2,700	.....	2,700	370,638	In Army
British Empire	1,241,000	260,000	1,501,000	188,600	1,100	189,700	1,690,700	As below
Australia	43,000	38,000	81,000	3,000	500	3,500	84,500	Separate
Canada	30,000	40,000	70,000	3,000	.....	3,000	73,000	Separate
Great Britain	950,000	.....	950,000	180,000	.....	180,000	1,130,000	Separate
India	200,000	150,000	350,000	1,000	.....	1,000	351,000	Separate
Ireland	7,400	16,200	23,600	400	200	600	23,600	In Army
New Zealand	8,000	10,000	18,000	500	200	700	18,700	Separate
South Africa	3,700	15,200	18,900	700	200	900	18,900	In Army
Bulgaria	100,000	510,000	610,000	3,200	.....	3,200	610,000	In Army
Chile	40,915	212,000	252,915	2,062	100	3,062	255,977	Separate
China	2,000,000	1,000,000	3,000,000	1,000	500	1,500	3,001,500	Separate
Colombia	14,749	100,005	114,754	957	.....	957	114,754	In Army
Costa Rica	588	.....	588	2	.....	2	588	In Army
Cuba	14,542	29,389	43,931	205	109	314	43,931	In Army
Denmark	11,000	89,000	100,000	975	.....	975	100,000	In Army
Dominican Rep.	3,212	10,000	13,212	31	.....	31	13,212	In Army
Ecuador	5,450	40,000	45,450	450	.....	450	45,450	In Army
El Salvador	3,370	708	4,078	78	20	98	4,078	In Army
Estonia	16,500	100,000	116,500	500	.....	500	116,500	In Army
Finland	301,300	.....	301,300	1,300	.....	1,300	301,300	In Army
France	4,000,000	1,263,000	5,263,000	82,000	135,000	217,000	5,480,000	Separate
Germany	3,500,000	3,350,000	6,850,000	317,000	21,000	338,000	7,188,000	Separate
Greece	140,000	455,000	595,000	1,660	4,500	6,200	601,200	Separate
Guatemala	6,000	27,660	33,660	100	.....	100	33,660	In Army
Haiti	2,715	551	3,266	.....	.....	.....	3,266	.....
Honduras	2,380	2,002	4,382	75	.....	75	4,382	In Army
Hungary	400,000	300,000	700,000	4,500	.....	4,500	700,000	In Army
Italy	2,240,000	5,175,000	7,415,000	116,000	102,000	218,000	7,633,000	Separate
Japan	1,500,000	4,771,000	6,271,000	37,000	16,000	53,000	6,271,000	In Army
Latvia	22,350	200,000	322,350	350	.....	350	322,350	In Army
Lithuania	25,775	287,000	312,775	775	.....	775	312,775	In Army
Mexico	48,647	63,407	112,054	646	.....	646	112,054	In Army
Netherlands	500,000	160,000	660,000	600	.....	600	660,000	In Army
Nicaragua	2,500	600	3,100	44	.....	44	3,100	In Army
Norway	15,000	120,000	135,000	1,000	.....	1,000	135,000	In Army
Paraguay	12,170	87,934	100,104	170	.....	170	100,104	In Army
Peru	12,203	20,000	32,203	1,677	80	1,757	33,960	Separate
Portugal	55,800	460,000	515,800	986	.....	986	515,800	In Army
Rumania	800,000	1,000,000	1,800,000	15,472	.....	15,472	1,800,000	In Army
U. S. S. R.	3,110,000	4,010,000	7,150,000	110,000	40,000	150,000	7,150,000	In Army & Navy
Spain	350,000	600,000	950,000	40,000	.....	40,000	990,000	Separate
Sweden	100,000	525,000	625,000	1,000	.....	1,000	626,000	Separate
Switzerland	480,000	100,000	580,000	5,000	.....	5,000	580,000	In Army
Turkey	510,000	200,000	710,000	3,500	.....	3,500	710,000	In Army
Uruguay	7,016	24,000	31,016	318	.....	318	31,016	In Army
Venezuela	13,700	3,000	16,700	200	.....	200	16,700	In Army
Yugoslavia	500,000	1,340,000	1,840,000	6,500	500	7,000	1,840,000	In Army
United States	227,000	360,000*	587,000	22,508	5,748	28,256	615,256	In Army

*The National Guard has a strength of 235,000. Trained reserves in the strict sense consist only of 25,000 enlisted men and 100,000 officers (both figures approximate). The R.O.T.C. and C.M.T.C. are not included in these figures because there is no obligation to serve. †Urban police.

will permit. In other words, to put in close support of the infantry artillery weapons which offer a smaller target than do the ordinary field guns of around 3-in. in calibre, while at the same time having the benefit of the greater fire power of calibres which offer too much of a target to be used in as close as those around 3-in. in calibre.

The other tendency is to evolve guns with mounts which will permit them to be used for more than one purpose. That is, to have anti-tank guns which can also fire on aeroplanes and infantry, and to have anti-aircraft guns of greater than 3-in. calibre which can be used for ground targets as well.

Germany is leading in both of these tendencies. The 77-mm. gun which was formerly the main artillery armament of her infantry divisions has disappeared from these divisions. They are still used, however, in the armoured motor divisions. The artillery of a German infantry division today is armed with 105-mm. howitzers, for close support of the infantry with its trench mortars and light anti-tank and anti-aircraft guns, and 150-mm. howitzers and 100-mm. guns for more distant support.

Germany has today an 88-mm. anti-aircraft gun which can be used not only against aviation but also for fire against trenches and batteries on the ground.

Mechanized Forces and Cavalry.—Since the war of 1914-18 there has been a great deal of discussion and experimentation with respect to the organization and armament of mechanized forces and whether or not they could replace horsed cavalry and the old type of infantry division on foot with its accompanying horsed artillery. While the organization of the mechanized forces varies considerably in different armies and is still being changed in some of them, the Sino-Japanese War, the Civil War in Spain, and Germany's quick suppression of Poland indicate three fundamental principles:

(1) Mechanized forces are not independent forces, but are primarily for use in conjunction with motorized infantry and artillery and horsed cavalry, all supported by aviation.

(2) Horsed cavalry cannot be replaced by mechanized forces. The limitations of mechanized forces very often correspond with the powers of cavalry and vice versa. In other words, the best results are gotten by a combination of horsed cavalry and mechanized forces.

(3) The infantry on foot with its accompanying horse-drawn field artillery is still the backbone of any force to be used in heavy combat. This is not changed by transporting it in motor trucks when they are available any more than it was changed when railways were first used for transport purposes.

The Germans have two types of mechanized division—the Light Division and the Panzer or Armoured Division. The Italians also have two: the Celeri or Light Division and the Corazzata or Armoured Division. In each case the Light Division includes the lighter mechanized troops, such as motorcycle infantry and machine guns, light tanks, and motorized infantry, while the mechanized division consists of tanks, artillery, and various auxiliary arms and services (see LIGHTNING WAR).

In the French Army there are two types of cavalry divisions. The first is the Cavalry Division and the second the Light Mechanized Division. The Cavalry Division consists of two brigades of horsed cavalry, a regiment of artillery and various motorized units including anti-tank guns. The Light Mechanized Division is made up of a regiment of armoured reconnaissance cars, two light mechanized brigades, motorcycle troop, motorized anti-tank guns, motorized artillery regiment, and various motorized services.

Japan in her war in China and Franco during the Spanish Civil War, found it necessary to considerably increase the number of horsed cavalry regiments. The Germans have recently decided to increase their horsed cavalry. The Italians have at all times maintained their horsed cavalry. The Polish cavalry failed in the campaign against Germany because it was not equipped with modern armament nor supported by mechanized forces and aviation. Russia has about 23 horsed cavalry divisions. She is also reported to have 6 mechanized divisions. Great Britain has 2 inde-

pendent mobile divisions, 12 mechanized and 2 horsed cavalry regiments. The Japanese Kwantung army is motorized and mechanized, but the details are secret.

Army and Navy Air Forces.—In the United States and Japan, the army and navy each have their own air forces. In other countries the air forces are independent of the army and navy except that in Russia the land forces, air force, and sea forces are all parts of the same organization. The tendency is toward the U.S. and Japanese system as more and more the pilots of independent air forces assigned for duty with the navy remain with the navy.

Fortified Lines.—(See MAGINOT LINE; SIEGFRIED LINE.) The Swiss have built a fortified line from Basle to Lake Constance. There are numerous reports that Russia is engaged in constructing fortified lines along her western or European frontier and her eastern Amur river frontier. It is reported that Rumania has built on her Russian and Hungarian frontiers fortified lines, known as the King Carol Line. The various sections of the fortified line on the former Czecho-Slovakian frontier with Germany are now in German hands as a result of the annexation of that country. (See also AIR FORCES; CHEMICAL WARFARE; EUROPEAN WAR; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR; MARINE CORPS; MUNITIONS OF WAR; NATIONAL GUARD; NAVIES OF THE WORLD; SPAIN, CIVIL WAR IN.)

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Arms Embargo: see INTERNATIONAL LAW; LEGISLATION, FEDERAL; NEUTRALITY; UNITED STATES; REPUBLICAN PARTY.

Arosemena, Juan Demostenes (1879-1939), Panamanian statesman. After completing his education he worked with a railroad construction company in Ecuador and upon his return to Panama was a departmental chief in the ministry of war and navy, and in the ministry of public instruction and justice. In 1906 he was secretary of the National Assembly and two years later high court judge of the republic. He became governor of Colón province in 1922 and thereafter held several portfolios in Panamanian cabinets. He was elected president of Panama in 1936 and served in this office until his death. President Arosemena died December 15 at Penonome, Panama.

Art: see AMERICAN LITERATURE; ARCHITECTURE; PAINTING; SCULPTURE; FAIRS AND EXHIBITIONS; etc.

Art Exhibitions. In the United States art events at the two fairs created widespread interest. San Francisco's Golden Gate Exposition featured Pacific Cultures, Contemporary Art, and Masterworks of Five Centuries. Among the latter, the Royal Italian Government loans were later seen at the Art Institute of Chicago. The New York World's Fair presented Masterpieces of Art and American Art Today.

Many attractive exhibitions centred about a general topic. Eight New England museums, comprising Andover's Addison Gallery of American Art, Boston's Museum of Fine Arts and Institute of Modern Art, New Haven's Yale Gallery of Fine Arts, Cambridge's Fogg Art Museum, and the museums of Worcester, New London and Providence joined in showing various aspects of New England art. Sources of Modern Art were revealed at the Institute of Modern Art in Boston. Life in America was illustrated at the Metropolitan Museum of Art. Artists Unappreciated in Their Day came into their own at the Toledo Museum of Art. Hunting

and racing subjects were viewed at the Baltimore Museum of Art. Mention should also be made of Classics of the Nude and Views of Paris at Knoedler's, French Sculptors of the 17th, 18th, and 19th Centuries at Seligmann, Rey and Company.

Particular periods were emphasized in the Whitney Museum of American Art's 20th Century Artists; in the Worcester-Philadelphia Exhibition of Flemish Painting; in Detroit's Pre-Columbian Art of Mexico, Central America, and Peru; in the Metropolitan's Augustan Art; in the Schaeffer Galleries' 17 Masterpieces of the 17th Century.

Deserving attention among the usual annuals and biennials were Pittsburgh's Carnegie International, perhaps the last for some years, with a fine American section; Cincinnati's 46th Annual of American Art, one of the largest in its history, and the Chicago Art Institute's Half a Century of American Art.

The work of William Blake was celebrated at the Philadelphia Museum of Art. Despiau and Maillol shared honours at Boston's Institute of Modern Art. New York's Museum of Modern Art commemorated Forty Years of Pablo Picasso (in collaboration with the Art Institute of Chicago). Notable 19th and 20th century painters displayed by dealers included Jongkind at Carroll Carstairs', Newman and Ryder at Knoedler's, Renoir at Durand-Ruel, Iacovleff at the Grand Central, Eilshemius at the Kleemann Gallery.

Europe was the scene of many important art events, from the Prado Masterpieces at Geneva to Scottish Art at Burlington House. Swiss art through the centuries appeared at the Kunsthau, Zürich. In Holland the Art of the Early Middle Ages was shown at Utrecht, French sculpture of the 19th century in the Stedelijk museum, and the Bible in Dutch Art in the Rijks museum, Amsterdam. France observed the 150th anniversary of the French Revolution with exhibitions at the Musée Carnavalet and at the Orangerie in Paris, and at Versailles. Other worthwhile Paris exhibitions ranged from the Salon of Contemporary Sculptors, James Ensor at the Galerie de la Gazette des Beaux-Arts, Cézanne at Paul Rosenberg's, Georges Michel at Guy Stein's, to the Masterpieces of the Museum of Montpellier at the Orangerie and the Ballets Russes de Diaghilev at the Musée des Arts Décoratifs. Italy staged numerous outstanding shows: Leonardo, in Milan; Veronese, in Venice; the Medici exhibition, in Florence; Pordenone and Renaissance Painting in Friuli, in Udine; Brescian Renaissance Painting, in Brescia; Gothic and Renaissance Art in Piedmont, in Turin; 15th Century Sienese Sculpture in Siena. Belgium rendered homage to Hans Memlinc, in Bruges, and in

ALL EXHIBITS of the Tate Gallery, London, were securely packed and shipped to undisclosed centres, safe from air raids, in the last week of Aug. 1939



Liège arranged an exhibition built about water as shown in the art of all periods and countries. Germany showed ancient Japanese art, in Berlin; Old German Art in the Danube Region, in Vienna; Hans Thoma, in Karlsruhe. (D. O.)

Art Galleries and Art Museums. The year 1939 closed the decade in a magnificent manner for art galleries and museums and for those of the United States of America in particular. For the first time a number of the most universally celebrated masterpieces of art from Europe crossed the water and were enjoyed by millions of Americans in their own country. Important new museum buildings were in the process of construction and others were dedicated. Political conditions in Europe made it possible for the superb and unique masterpieces from the Prado Museum in Madrid to be seen in Geneva, Switzerland, before their return to Spain. In spite of the dread of war since Munich of 1938, very significant exhibits were put on in Europe in 1939, notably the exhibition of Veronese in Venice, the exhibition of the Medici in Florence, and the superb exhibit of Leonardo da Vinci's works in Milan—in which were displayed fascinating full-sized working models of his inventions made from his drawings.

The war clouds which settled over Europe early in September saw the nations rushing frantically to save the priceless essence of their past civilizations, their wealth of art treasures. This brought forcefully to the minds of everyone in the world the great value of art to mankind. Museums the world over are pitifully vulnerable to bombing from the air, and museum architecture of the future must provide means to protect works of art from attack.

The citizens of the United States of America were particularly fortunate in that great masterpieces from Europe were on view in two World's Fairs. The New York Fair showed two significant art exhibits; one, Masterpieces of Art, including loans from Europe, two, a regional exhibition of contemporary American art in which the attempt was made to select representative examples by regional juries of artists. The San Francisco Fair held several outstanding exhibits; an old master exhibition for which most important examples of painting and sculpture were allowed to leave Italy for the first time: Botticelli's "Birth of Venus," Raphael's "Maddonna of the Chair," an original work by Michelangelo, and others. This remarkable collection was shown at the Art Institute of Chicago after the close of the Fair and met with great popular acclaim. Work by North American Indians at the Exhibit of Pacific Cultures at San Francisco proved for all time the depth of feeling and unusual ability of that race. The Half a Century of American Art Exhibition at The Art Institute of Chicago made a valuable contribution to American art in a survey comprising examples it had exhibited from 1888 to 1938. A remarkable loan exhibition of Flemish art was held at the Worcester Art museum and at the Philadelphia Museum of Art. A memorial exhibition of the work of the important American artist and teacher, Kimon Nicolaïdes, was held in New York in March.

Modern art was dignified by the new building of the Museum of Modern Art in New York which opened on May 10, giving increased quarters for the very important service which this organization has rendered for a decade to the public of the United States. About the same time, on June 20, Hitler was branding modern art as "degenerate" by selling the modern masterpieces from German museums at auction in Lucerne, from which sale many significant works passed into museums and collections in the United States and Europe. The Fogg Art museum, Harvard university, gave a \$2,000 fellowship for research in modern art. The largest exhibition of Picasso—Forty Years of His Art—was shown at the Museum of Modern Art and will be on view at the

Art Institute of Chicago in 1940. The architectural competition for the new Smithsonian Gallery of Art, Washington, D.C., was won by Eliel Saarinen, Eero Saarinen and J. Robert F. Swanson.

Samuel H. Kress gave his collection of 375 Italian paintings and sculptures to the United States, to be installed with the Mellon collection in the National Gallery of Art (the building for which will be completed in 1940). The new Allerton Wing, a handsome gift of Robert Allerton, provided the Art Institute of Chicago with ten new galleries in the Decorative Arts Department, allowing a rearrangement of objects.

The State Department of the United States held a conference on Inter-American Relations in October in which the field of art was discussed and closer co-operation between the North and South American republics encouraged.

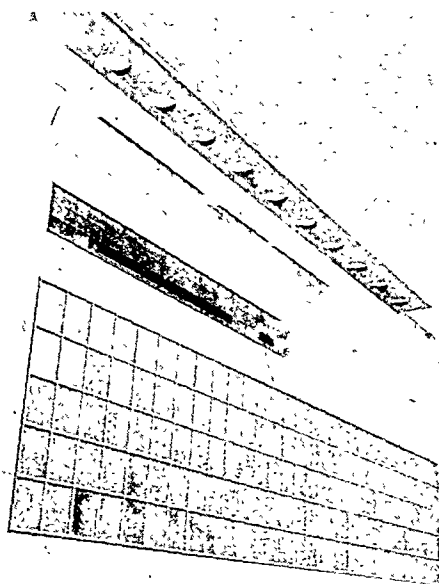
In the British Isles the new gallery of art at Southampton forms part of the civic centre. The Drapers' Wing at the Ashmolean museum at Oxford was opened. The Scottish Royal museum dedicated a new gallery of Oriental Art in modern museum design. Roman antiquities were displayed in the new museum at Cirencester. In Grahamstown, South Africa, a new museum was opened. In France, the town of Chartres inaugurated the new museum in the old episcopal palace. At Besançon a committee was formed to acquire the birthplace of Gustave Courbet at Ornans to convert it into a museum. At Dortmund, Germany, the collections of the popular art of Westphalia were rearranged. In May the Nationalgalerie in Berlin organized an exhibition of art and artistic life in the territories newly acquired by Germany. The art world suffered a distinct loss with the death of Max Doerner, Professor of the Academy of Fine Art in Munich, the author of *The Materials of the Artist*, a classic in the study and technique of picture making.

In Greece, the Zygomalas museum at Salessi, a village of Attica, showed peasant embroideries. In Moscow two exhibitions were held: that of Socialist Industry in April; and in the State Museum for Modern Western Art an exhibition of modern French landscape painting. In Japan the new Imperial museum of Tokyo was installed in a recently constructed cement building in oriental style. In Sweden, the Linköping museum was opened—one of the most modern museum buildings in Sweden; and the new Zorn museum in Mora, containing a reproduction of Zorn's Stockholm studio, was completed. El Museo de Indias in Madrid was created to take care of American antiquities in Spain, stressing literary and artistic documentation of the colonial epoch. In South America the National Museum of Peru at Lima published one of a series of unusual notebooks on Peruvian art. The Museo Nacional de Bellas Artes at Buenos Aires re-opened at the end of May.

(L. B. BR.)

Arthritis. The discovery of a spontaneous infectious polyarthritis in the rats of Java, presenting exceptional features of parallelism with chronic rheumatoid arthritis in man, by Collier and his colleagues, offers promise of yielding information of practical importance. Indeed, the disease can be transferred to normal rats by injecting arthritic exudates from the diseased animals. The lack heretofore of an experimental animal with a natural disease similar enough to that existing in man has severely hampered certain aspects of research. A progressive proliferative polyarthritis, bearing a clinical and pathologic resemblance to human rheumatoid arthritis has also been produced experimentally in mice by filterable, pleuropneumonia-like microorganisms recently isolated from the brain of a normal mouse by Sabin and co-workers which may also contribute to experimental observation.

Other studies on viruses in fibrositis and arthritis in man and animals have been reported by Gordon, by Dyson, and by Eagles.



GLASS FAÇADE of the Museum of Modern Art, opened May 10, 1939, at New York city

The ubiquitous streptococcus and its possible relation to arthritis continued to engage attention, especially by Cecil and Angevine, and by Gibson.

The joint fluid and joint tissues have received additional study during the past year. A tendency to differentiate more between different stages of the same process, between the same process in different joints, and between the membranes of the same joint in different locations has become evident.

Environmental factors as they affect the clinical course of rheumatoid arthritis have been studied by Cobb. By listing in parallel columns the exacerbations and remissions of the arthritic symptoms and the social data, a relationship was shown between environmental stress, especially poverty, grief, and family worry, and the onset and exacerbations of rheumatoid arthritis. This is apparently the first really controlled factual study of the subject.

Vaccines again have been rather convincingly condemned as routine instruments of treatment, especially by the report of Sidel and Abrams. The value of sulphanilamide in gonorrhoeal arthritis and its uselessness in rheumatoid arthritis has been confirmed by Coggeshall and Bauer's careful study. Abrams and Bauer evaluated the effect of massive doses of Vitamin D on 18 patients with rheumatoid arthritis, concluding that this method of treatment is of little or no value in altering the course of the disease. Colloidal sulphur in the treatment of the disease has been rejected by the Council on Pharmacy and Chemistry of the American Medical Association, with the conclusion that it may have some value in affording temporary symptomatic relief in some form of arthritis but that its toxicity, indications, and contraindications are not defined. Freyberg and his colleagues studied sulphur metabolism and the effect of sulphur in rheumatoid arthritis, concluding that there was no biochemical or metabolic need for or benefit from sulphur medication in rheumatoid arthritis. Additional studies of gold therapy have indicated its effectiveness in some instances but have continued to disclose high toxicity. There have been some promising papers on the local treatment of certain joint disorders by infiltration with a local anaesthetic, as has been principally recommended by Leriche and his associates in France.

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"Infectious Polyarthrititis of Rats," *J. Path. & Bact.* vol. 48 (May 1939); Council on Pharmacy and Chemistry, "Colloidal Sulfur in the Treatment of Chronic Arthritis," *J.A.M.A.*, vol. cxi (Oct. 29, 1938). (E. P. J.)

Artillery: see ARMIES OF THE WORLD: *Artillery*; LIGHTNING WAR; MUNITIONS OF WAR: *Artillery*; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR.

Art Institute of Chicago: see ART GALLERIES AND ART MUSEUMS.

Art Sales. Among American sales, that of the property of Goodall and Hepburn, at the American Art Association-Anderson galleries, realized \$51,755. Stuart's "Portrait of Commodore Barry" was purchased for \$30,000 by the Macbeth galleries. At Parke-Bernet's, the fourth Hearst auction reached a total of \$227,000; Gustave Oberlaender's collection produced a total of \$98,940. With the close of the 1938-39 auction season a summary of the activities at these galleries showed total purchases amounting to \$2,417,330. The late Mrs. Cornelius J. Sullivan's collection was also dispersed by Parke-Bernet and a total of \$148,730 was reached in the two night sessions. The top price, \$27,500, was paid by Walter P. Chrysler for Cézanne's portrait of his wife. Van Gogh's "Portrait of Mlle. Ravoux" attained the sale's second highest of \$19,000.

Despite the war's outbreak and the uncertainty preceding it, the London season was lively. At Christie's further art treasures of Hearst reached a total of £11,497. The Christie sale in aid of Lord Baldwin's Fund for Refugees resulted in £15,647 for the 386 lots sent in. A first portion of Dr. Pringsheim's renowned Italian majolica was auctioned at Sotheby's. Two days produced £12,061, although prices were often disappointing. The highest was £370 for a 15th century Florentine "oak-leaf" jar. At Christie's, Whistler's "At the Piano" from Sir Edmund Davis's collection went to Stevenson Scott for £6,405, the highest price for Whistler in a London auction. The first owner had obtained it in 1860 for £30. Exhibited, after the London auction, at Scott and Fowles in New York, the picture was snapped up by a prominent American collector. The sensation of the season was Christie's auction of a newly discovered work by Pieter Brueghel, from the late Mrs. Frank Holbrooke's collection. Bought by Holbrooke for £700, it went to Colnaghi for £8,190 (the highest price paid in an English auction for Brueghel). At Sotheby's, Goya's "Portrait of Doña Zarate" was acquired by Knoedler for £6,800, a record price. Clarence Mackay's arms, armour, and works of art totalled £21,936 at Christie's.

An event of the summer was the sale by the Fischer gallery in Lucerne, Switzerland, of paintings and sculptures by modern masters from German museums.

In Paris a Cézanne landscape, "Le Pilon du Roi Vu de Bellevue," drew 542,000 francs. "Les Deux Soeurs" of Renoir brought 330,000 francs. Two landscapes by Bonnard were knocked down for 75,000 and 46,000 francs. (D. O.)

Asbestos. World production of asbestos increased to a new high record of about 600,000 tons in 1937, declined sharply in 1938, but rose again in 1939. Asbestos is largely of British origin, since 90% of the 1929 output and 77% of that of 1937 was mined in the British Empire. In 1937 Canada supplied 61% of the world total, Southern Rhodesia 9%, South Africa 4% and Cyprus 2%; the only large producer outside the Empire was the Soviet Union, with 20% of the 1937 total, increased from 7% in 1929. The United States consumes about one-half of the world supply but has only a minor output, which, however, has increased nearly four-fold during the past few years, reaching 12,600 tons in 1937. United States imports increased in 1937 to 249,000 metric tons, but dropped to 14,500 tons in 1938.

Preliminary estimates for 1939 are 300,000 tons for Canada, 53,000 tons for Southern Rhodesia, and South Africa 22,000 tons. (G. A. Ro.)

Ascension: see BRITISH WEST AFRICA.

Asia: see AFGHANISTAN; CHINA; INDIA, ETC.

Asphalt. More than half of the world supply of native asphalt comes from the famous asphalt lake of Trinidad; the bulk of the remainder is divided between Egypt and the United States, with possibly 10% distributed among several minor producers. A number of countries, with the United States in the lead, produce considerable quantities of asphaltic or bituminous rock, carrying usually less than 10% of true asphalt. The largest item, however, is petroleum asphalt, of which there was produced in the United States in 1938 some 5,794,000 short tons, 73% from domestic petroleum, and 27% from foreign. As compared with this, the domestic production of bituminous rock was 483,500 tons, and native asphalts only 28,650 tons. Production in Trinidad declined by more than half in the past decade, to 111,965 long tons in 1936, recovering to 145,900 tons in 1937.

(G. A. Ro.)

Assassinations. A list of assassinations, actual or attempted, during 1939 includes:

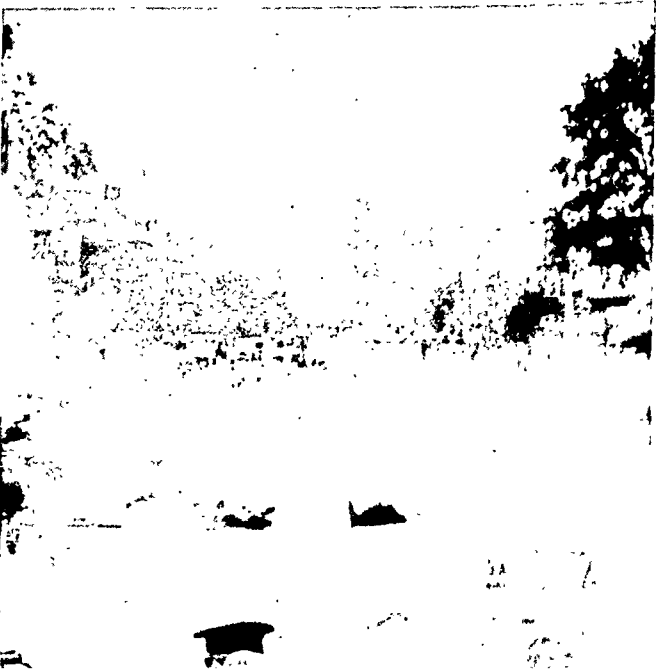
Feb. 20 Tcheng Loh (Ch'en Lu), foreign minister in Japanese puppet Gov't at Nanking, shot to death by 20 Chinese assassins in Shanghai.

April 4 Mosul, Iraq. George E. Monck-Mason, British consul, slain by mob after report that King Ghazi, killed in a motor car accident, had been assassinated by Britons.

Sept. 21 Bucharest, Rumania. Premier Armand Calinescu slain by six members of Fascist Iron Guard. The new Rumanian Gov't, headed by Gen. George Argesanu, ordered execution of hundreds of Iron Guardists and imprisonment of others in reprisal.

Nov. 8 Munich, Germany. Apparent attempt to assassinate Adolf Hitler and high Nazi leaders failed when they left Buergerbraeu hall shortly before time bomb exploded; 8 were killed.

THE ASSASSINS of Premier Armand Calinescu were executed on the site of their crime in Bucharest Sept. 21, 1939, and left lying in the street for 24 hours



Asthma: see ALLERGY.

Astronomy. The dedication of the McDonald observatory in Texas contributed much to the progress of astronomy in 1939. The 82-inch reflector, attested by experts to be one of the finest, has in the first few months of its operation made possible notable discoveries and contributions in the field of spectrographic astronomy, of particular interest being the discovery by Kuiper of several new white dwarf stars. The dedication in May was celebrated with a seminar on galactic and extragalactic structure in which a considerable number of the foremost astronomers and physicists of North America and Europe participated.

Solar System.—The Sun. An investigation of the complexity of form and motion of solar prominences by McMath, based on the great wealth of material obtained by him with the spectroheliokinematograph, appears to prove conclusively that the observed motions are actually motions of material, and that the sudden accelerations observed by Pettit and others are real. No satisfactory theory has yet been offered to explain these complex motions. The projected expansion of the observational procedure to give simultaneous observations in three dimensions will add much to this study.


The influence of the absorption of water vapour on solar radiation was investigated by Adel in the spectral region 8.34μ to 13.40μ . The absorption co-efficient, which describes the degree of opacity produced by water vapour in this spectral region, was then applied to determine the form of the solar energy curve in this region when unaffected by water vapour absorption. Adel finds satisfactory agreement between the experimentally derived form of the energy curve and the black body curve for $6,000^\circ$ or $7,000^\circ$ K.

Planetary System.—An unusual number of comets was under observation during 1939, 13 being discovered. Of this number seven were previously known comets which were re-discovered, whereas the remaining six were, so far as is known, new comets.

The planetary phenomenon which occasioned most interest among astronomers was the close approach of Mars at the opposition of July 28. Though poorly situated for northern observers, many visual and photographic observations were made. Preliminary reports by Slipher and by Wright indicate a number of changes in surface features since previous oppositions, and the series of photographs obtained by Slipher at Bloemfontein show features which have previously defied observation by photography.

A possible explanation of the vivid and varied colouration observed on Jupiter has been suggested by Wildt. It would be an obvious advantage if the various colours could be ascribed to a single chemical principle. The reaction between metallic sodium and both gaseous and condensed ammonia offers such a chemical principle and supplies highly coloured systems, both liquid and solid. Changes in temperature produce changes in colour, and a range of colours adequate to produce the varied colouration observed is produced. The absence of vivid colouration from Saturn's atmosphere is explained by the lower temperature of that planet. The origin of the sodium involved is unknown, but it may come from interplanetary space.

A hypothetical model for the constitution of the giant planets Jupiter and Saturn has been proposed by Wildt to explain the low mean density of these planets. The proposed model consists of three homogeneous layers, namely, (1) a dense core similar in structure to the terrestrial planets, (2) a thick layer of ice surrounding the core, and (3) a layer of highly compressed condensed gases, chiefly solid hydrogen, on top of the ice. Appropriate values of the densities of the three layers make possible the determination of the radii of the surfaces of discontinuity, the values being



LARGEST OF ITS KIND in the world, this camera is being used at Cook observatory, Wynnewood, Pa., to photograph a complete atlas of the heavens

for Jupiter, 0.82 and 0.43 of the equatorial radius, and for Saturn 0.66 and 0.26 of the radius. The abundance of hydrogen and oxygen relative to the metals required by this model is not inconsistent with the relative abundance of these elements in the solar atmosphere as determined by Russell. Of interest in connection with Wildt's hypothesis is the suggestion of Peek that the red spot on Jupiter is a huge berg, perhaps of ice and nitrogen, floating in a liquid outer layer of the planet.

Several observatories which participated in the international program for the observation of Eros in 1930-31 have completed reductions of their observations. These thousands of observations are now turned over to Jones for use in making new determinations of the solar parallax and the mass of the moon.

Stars.—Special Stars and Stellar Structure. Studies of the spectra of Arcturus by Miss Davis and of a selected list of A and B stars by Struve have added new identifications of many lines. An investigation of the spectra of M-type supergiant stars by Spitzer seems to indicate that the atmospheres of these stars are characterized by almost complete lack of thermodynamic equilibrium. Bowen and Wyse have discovered recently predicted forbidden lines of several of the more common metals in the spectra of three planetary nebulae. This discovery removes the chief qualitative differences in chemical composition between these nebulae and the stars. A photographic atlas of spectra of Nova Herculis 1934, compiled by Stratton and Manning, gives an unusually complete record of the spectral changes.

Eclipsing stars have received considerable attention during 1939. Kron's photoelectric observations of YZ Cassiopeiae have yielded a more accurate determination of the degree of limb darkening.

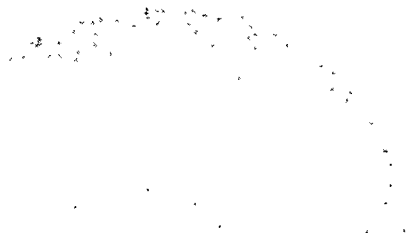


GREAT NEBULA OF ANDROMEDA, photographed at the Cook observatory, which is compiling a complete atlas of the sky

ing than has hitherto been made for any eclipsing star. The darkening co-efficient for the larger star is 0.491 ± 0.038 as compared with Pannekoek's theoretical value for this A₃ star of 0.65.

Russell has made a theoretical investigation of the ellipsoidal figures of close pairs and suggests that, in cases where the masses are known, a theoretical ellipticity factor should be substituted for that obtained from the light curve in making the solution for orbital elements. He concludes that the light curve does not permit differentiation between ellipsoids of different figure and ellipsoids of similar figure but of different dimensions.

SUN SPOTS photographed Sept. 11, 1939, at the U.S. Naval observatory, Washington, D.C.



The "photometric ellipticity" determined from the light curve depends on the geometrical form of the bodies, on limb darkening, and on the variation of surface brightness with gravity. The gravity effect may be studied in this way, but not the figure or the internal constitution.

Eclipsing stars with variable periods have been investigated by Dugan and Miss Wright. Of 28 stars studied with the aid of the Harvard observatory plate collection, 21 have periods surely or probably variable, while the remaining seven probably have constant periods. The Harvard plates made possible the extension of the study over a period of nearly 50 years, which is important in view of the slowness of the changes. It was previously thought that most observed changes of period of these stars could be attributed either to apsidal motion or to light-time across the orbit around a third body. The present work demonstrates that many of these changes are irregular and at present inexplicable, and points the way to a promising new field of investigation.

The eclipsing star VV Cephei, similar to but much larger than ζ Aurigae, consists of a supergiant star of spectral type M2 and a B-type primary star. Goedicke has made a spectrographic study of this star during its emergence from eclipse, which gave an opportunity for a detailed study of the extensive atmosphere of the M star through the effect on the light of the B star shining through it. The radius of the M star is about 1,200 times that of the sun, the masses of the M and B stars are 47 and 33 times the sun respectively, and the density of the M star is 3×10^{-8} .

Many theories have been proposed to account for the source of stellar energy. Whatever process supplies the requisite energy must involve a transformation of mass into energy, probably by a change of one kind of atoms into another with release of energy corresponding to the change in the total mass. Bethe has explored the possible transformations which can occur under conditions existing in the interiors of ordinary dwarfs, and finds the following chain of reactions possible. C¹² plus a proton gives N¹³ with radiation of energy. N¹³ then loses a positive electron and changes into C¹³ which, upon addition of a proton changes into N¹⁴ with emission of energy. Addition of another proton transforms this into O¹⁵ with further energy emission, the O¹⁵ subsequently losing a positive electron and changing into N¹⁵. N¹⁵ plus a proton might form ordinary oxygen O¹⁶, but Bethe calculates that it is several thousand times more probable that the nucleus would split, giving He⁴ and the original C¹². Thus carbon acts as a catalyst for the transformation of hydrogen into helium. This process will continue at an ever increasing rate until all of the hydrogen has been used. Bethe calculates that this process will supply sufficient energy for the sun at central temperatures of 18 to 21 million degrees, depending on the percentages of hydrogen and nitrogen available. These temperatures, computed from nuclear theory, are in good agreement with the central solar temperature determined from astrophysical data. It appears that the principal source of energy for the main-sequence stars has been found, though the very rapid radiation of the giants cannot be thus explained. A recent investigation, by Greenstein, of the spectrum of ν Sagittarii indicates a higher percentage of helium than hydrogen in this star's atmosphere, which may indicate that this star is already well advanced in the "life history" outlined by Bethe.

Stellar System.—Noteworthy contributions to the study of the structure of our galaxy have been made during 1939. Joy has investigated the velocities of 156 Cepheid variables situated near the plane of the galaxy and well distributed in longitude. Distances obtained from the period-luminosity law were corrected for interstellar absorption. Solutions by Oort's method give for the longitude of the centre of rotation, $325^\circ 3 \pm 1^\circ 3$, and for the rotation effect at a distance of one kiloparsec, 20.9 ± 0.8 km/sec. The

distance of the centre is estimated to be 10 kiloparsecs and the circular orbital velocity of the sun is determined as 296 km/sec with a period of 207,000,000 years.

One outstanding difficulty in the problem of galactic structure, the absorption of starlight by clouds of obscuring matter, has been investigated by Stebbins, Huffer, and Whitford. These observers have measured the colours of 1,332 B-type stars with a photoelectric photometer. From photoelectric measures of various regions of the spectra of a selected group of stars they have determined that the absorption varies inversely as the wave-length. This law of selective absorption leads to values for total absorption in visual and photographic light of seven and nine times the colour excess, respectively. The strongly reddened B stars are all found near the plane of the Milky Way, in the zone in which no extragalactic nebulae are observed. A limit to the absorbing material is found in the direction of the anticentre, where no star shows a colour excess greater than 0.3 magnitude, whereas no such limit is indicated in the direction of the galactic centre. Special studies of three bright regions in the Milky Way show that even these regions are only half as bright as they would appear if no absorbing clouds intervened.

External Galaxies.—Many photographs are now available for the determination of the number and structural form of extragalactic nebulae. However, as Hubble has pointed out, dynamical investigations of these objects are hampered by the scarcity of spectrographic data concerning internal motions. Of particular interest, therefore, is the spectrographic investigation of the rotation of the Andromeda Nebula by Babcock. His results show a nearly constant angular velocity for the outer spiral arms, and an angular velocity indistinguishable from zero in the region of eight to 10 minutes of arc from the nucleus. The core exhibits a period of rotation of about 1.1×10^7 years, whereas the period for the outer arms is about 9.2×10^7 years. It would appear that a large proportion of the mass of the nebula is in the outer regions beyond 20 minutes of arc from the nucleus. The near zero velocity closer to the nucleus may indicate a non-uniform distribution of mass along the radius vector. The Andromeda Nebula and the Galaxy have many features in common, the chief difference previously known being their diameters. A new discrepancy now appears when the nearly constant angular velocity of the outer parts of the Andromeda Nebula is compared with the planetary type of rotation apparent in our Galaxy. (See also PHOTOGRAPHY: *Applications*; TELESCOPES.)

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"Athenia": see SHIPPING, MERCHANT MARINE; SUBMARINE WARFARE; EUROPEAN WAR.

Athletics: see TRACK AND FIELD SPORTS.

Atom: see MATTER, STRUCTURE OF; PHYSICS.

Audiometer: see DEAFNESS.

Australia, Commonwealth of, area 2,974,581 sq.mi.; population (est. Dec. 31, 1938) 6,929,691. Chief towns (pop. Dec. 31, 1938): Sydney (1,288,720), Melbourne (1,036,000), Adelaide (321,410), Brisbane (325,890), Perth (220,330), Hobart (63,150); capital, Canberra. Ruler, King George VI; governor-general, the Rt. Hon. Lord Gowrie, V.C.; premier, R. G. Menzies; language, English; religion, Christian (census 1933: Anglican, 2,565,118; Roman Catholic, 1,161,455; Presbyterians, 713,229; Methodists 684,022; other Christians, 603,914).

History.—Two events, the death of the Commonwealth prime minister, J. A. Lyons, and the outbreak of war in Europe, exer-

PHOTOGRAPH OF MARS taken on July 27, 1939, with an "occluding disk" at the U.S. Naval observatory, Washington, D. C., as the planet made its closest approach to the earth in 15 years

cised an important influence upon the course of political developments during 1939. The death of Mr. Lyons on April 7, after seven continuous years of office, left the coalition Government of the United Australia Party and the United Country Party without a leader capable of uniting the discordant elements and of assuaging the latent personal antagonisms within its ranks. Increasing disruption had already led to the resignation in March of R. G. Menzies, attorney-general and deputy leader of the United Australia Party, following the Government's decision to postpone the introduction of its scheme for national insurance; and other resignations were threatening. In the face of this new emergency the governor-general commissioned Sir Earle Page, leader of the United Country Party, to carry on as prime minister until the United Australia Party (the senior partner in the coalition) could elect a new leader. When the United Australia Party showed its confidence in Mr. Menzies by asking him to lead the party the coalition broke down, and Mr. Menzies formed a Government chosen entirely from the United Australia Party. Despite frequent embarrassments the Government was able to continue in office until the adjournment of parliament in June. Mr. Menzies himself took over the Treasury, and entrusted the new Department of Supply and Development to R. G. Casey.

Before parliament assembled again war had broken out. All parties recognized the need for a national united front, and the Government was able to proceed with its defence plans without serious hindrance. Sir Henry Gullett was placed in charge of the ministry of information, and the defence portfolio was subdivided, the prime minister becoming minister for co-ordination of defence; G. A. Street, minister for the army; Sir Frederick Stewart, minister for the navy; and J. V. Fairbairn, minister for air; P. C. Spender was appointed acting treasurer. A war cabinet was set up, consisting of the prime minister, the ministers for the three services, the minister for information, W. M. Hughes (attorney-general and minister for external affairs), and Senator H. S. Fole (minister for the interior).

Foreign Affairs.—Complete identity of views with the Government of the United Kingdom was emphasized by the Commonwealth Government at the time of the Czecho-Slovakian crisis in March, and Mr. Lyons expressed his Government's readiness to co-operate with the United Kingdom Government in its efforts to deal with the international situation. With the approach of the Polish crisis Mr. Menzies reiterated in August Australia's determination to stand by Britain should she be forced into war. On the evening of September 3 the prime minister announced that

Australia was at war with Germany. The Defence Act was immediately proclaimed the over-riding law of the Commonwealth, and special measures for national security were brought into operation.

Military Measures and War-Time Precautions.—As a result of the war the Commonwealth's expenditure on defence during the fiscal year will amount to over £62,000,000. The year 1938's corresponding figure was £14,000,000. Naval personnel increased from 5,000 to 10,000, all ships of the Royal Australian Navy were immediately brought into commission, and a number of fast merchant ships were armed to undertake patrol duties.

By November the Australian Army had about 100,000 men undergoing training, of whom 20,000 formed a special force to be sent overseas for service early in 1940. The district commands for home defence were reorganized, and steps were taken to mechanize the entire army. A most significant event was the reintroduction of compulsory military training for home defence for men between the ages of 20 and 21. Compulsory training was suspended in 1929, but has since remained on the statute book, ready to be brought into operation by proclamation. Mr. Menzies has stated that there will be no conscription for overseas service.

It was announced in September that an air expeditionary force of 3,200 men, consisting of officers, air crews, and ground personnel sufficient to man six squadrons, would be sent abroad for service with the Royal Air Force. Early in November, however, the prime minister stated that, after consultation with the United Kingdom Government, it had been decided to cancel the original plan and instead to send about 200 officers and men to Great Britain immediately to man aircraft already ordered by the Royal Australian Air Force, and to serve as a general reconnaissance squadron with the Royal Air Force.

The new Department of Supply and Development immediately accelerated the manufacture of armaments and war materials by adapting the existing industrial organization to war-time purposes. Government munition factories have been enlarged and annexes set up in a number of private engineering works and railway workshops throughout the country. Plans for aircraft manufacture on a large scale were drawn up even before the war, and the Commonwealth Aircraft Corporation's new factory has already shown itself capable of producing several aeroplanes each week. In addition orders for training aircraft were placed in America.

Public Finance.—The fiscal year ended June 1939 produced a budget surplus of £627,000, revenue showing an increase of £5,500,000 on 1937-38, and expenditure an increase of £8,500,000. Mr. Menzies' budget, introduced a few days after the outbreak of war—the first £100,000,000 budget in the history of Australia—announced substantial increases in income tax, sales tax, and customs and excise duties, necessitated by greatly increased estimates of defence expenditure. On November 30 Mr. Spender, the acting treasurer, introduced a supplementary financial statement, as a result of which estimated defence expenditure for the fiscal year was almost doubled. It was not considered expedient to impose further immediate increases in taxation in view of the extra burdens already announced in September. Instead, Mr. Spender stated that the Government's financial policy would be weighted for the time being towards bank borrowing, with a return to public borrowing and taxation when economic circumstances justified it. Loan expenditure for 1939-40 was estimated at £48,000,000.

Unsettled political and economic conditions adversely affected loan operations early in 1939. Two internal loans, of £8,500,000 in February and £4,750,000 in May, both for public works, were undersubscribed, as was the £6,000,000 defence loan floated on the London market in June.

Economic Affairs.—Primary industries continued to suffer from the decline in export prices which began in the middle of 1937, and which inevitably reacted upon Australia's trade balance. Average

export prices fell by 16.6% from the level of 1938, and the sterling value of exports from £122,900,000 to £108,300,000. Since imports also fell heavily, however, the financial year 1938-39 closed with a favourable balance of £8,800,000. There was some reduction in the volume of London funds, which were particularly high in June 1938, but the investment of capital in Australia from overseas continued. Contracts entered into with the United Kingdom Government for the purchase of Australian export commodities may be expected to have a stabilizing effect on primary industries. Most important was the United Kingdom Government's acquisition of the wool clip for the term of the war and for one season following the cessation of hostilities. Butter, eggs, meat, and wheat also came within the scope of these negotiations. The disposal of surplus stocks of wheat and flour was particularly satisfactory, as the industry suffered severely not only from depressed price levels but also from severe drought conditions experienced at the beginning of the year. The Commonwealth Government acquired the whole of the 1939-40 crop and arranged to finance the growers pending the disposal of the wheat.

The value of flourishing manufacturing industries as a contribution to economic stability was particularly apparent in a year of falling commodity prices. As a result of recent industrial development Australia has achieved a national economy more balanced and less vulnerable to fluctuating market conditions. Though factory employment fell slightly during 1938-39 it still easily exceeded the 1936-37 average, and the demand for skilled workmen remained high. Plans for the establishment of the motor-car industry have proceeded despite the intervention of war, and proposals for the manufacture of tin-plate, aluminium, and bakelite have been put forward. A not unimportant stimulus to industrial development was provided by refugee immigrants, a considerable number of whom were admitted into Australia up to September. The outbreak of war, and with it the Government's growing demands for war material and equipment, naturally gave a decided impetus to secondary industry. By December 8,000 men and women were employed in the manufacture of munitions alone.

(L. R. Mc.)

Education.—In 1936: State schools, 10,307; average attendance, 792,148; private schools, 1,873; average attendance, 206,026; technical education, net enrolments, 92,949; business colleges, average attendance, 18,505; universities, number of students, 10,657. (See also EDUCATION: *British Empire*.)

Banking and Finance.—Revenue (actual 1938-39), £A95,064,000, (est. 1939-40) £A101,940,000; expenditure (actual 1938-39), £A94,437,000; ordinary (est. 1939-40), £A68,779,000; defence, £A33,137,000; public debt (June 30, 1939), £A1,295,022,972; notes issued (Aug. 28, 1939), £A48,525,000; gold and sterling reserve (Aug. 28, 1939), £A16,029,000; exchange rate, £A125 = £100 sterling.

Trade and Communication.—Overseas trade 1938-39 (merchandise): imports, £A124,484,000; exports, £A120,750,000; (bullion and specie): imports, £A3,562,000; exports, £A18,963,000. Communications and transport: 1938, roads, total mileage, c. 495,000mi.; metalled, c. 200,000mi.; railways open to traffic, 27,897mi.; airways, distance flown, 7,035,526mi.; passengers carried, 76,041; goods carried, 806,185lb.; mails carried, 378,088lb.; shipping with cargo and in ballast, in net tons, entered (monthly average 1937-38), 594,000, (monthly average 1938-39) 558,000; cleared (monthly average 1937-38), 591,000, (monthly average 1938-39) 553,000; motor vehicle registrations (Aug. 31, 1939): cars, 555,381; commercial vehicles, 253,819; cycles, 76,284; wireless receiving set licences, 1,134,048; telephones, number of lines, 491,468.

Agriculture, Manufactures, Mineral Production.—Production (in metric tons): wheat (1938-39), 4,109,600; gold (1938).

49,500 kilograms; wool (1938), 426,400; cane sugar (1938-39), 783,200; coal (1937), 12,286,000; lignite (1937), 1,527,000; iron ore (metal content) (1937), 1,255,000; pig iron and ferro-alloys (1938), 979,000; steel (1938), 1,157,000; wine (1937-38), 948,000 hectolitres; oats (1937-38), 312,000; barley (1937-38), 278,000; maize (1937-38), 173,200; potatoes (1937-38), 351,000; butter (1937-38), 195,700; lead (smelter production) (1938), 227,300; zinc (smelter production) (1937), 70,900; copper (smelter production) (1937), 17,700; superphosphates of lime (1938), 1,247,000; bauxite (1937), 7,900; tungsten ore (1937), 488; antimony ore (1937), 576; silver (1938), 380. Labour and employment: employment in factories (1928-29=100) (Aug. 1939), 120.2; number (average Aug. 1939), 519,250; unemployment, Trade Union returns (May 1939), 9.7%; recorded material production (1937-38), £A411,308,070. (W. H. WN.).

Australia, South: see SOUTH AUSTRALIA.

Autobiography: see AMERICAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE.

Autogiro: see AVIATION, CIVIL: *Technical Development*.

Automobile: see MOTOR VEHICLES; MOTOR TRANSPORTATION.

Automobile Accidents: see DISASTERS; INSURANCE, AUTOMOBILE; MOTOR VEHICLES; PSYCHOLOGY, APPLIED: *Accidents*; TRAFFIC ACCIDENTS.

Automobile Racing. John R. Cobb, a London fur dealer, made another successful assault upon the world's land speed record to highlight 1939 auto racing activities. He streaked through a measured mile on the Bonneville Salt Flats in Utah at 368.85 mi. per hour. By travelling more than six miles a minute Cobb vaulted back to the world's straightaway speed throne where he had reigned last year for the brief span of 24 hours. At that time Captain George E. T. Eyston surpassed him by attaining a mark of 357.5. Cobb's latest figure of 368.85, made Aug. 23, 1939, was the first to eclipse the existing record made by Captain Eyston. Cobb was driving a 2,600 horsepower 24-cylinder aluminium Railton Red Lion.

As usual, the outstanding feature of the year was the annual Memorial Day 500-mile Indianapolis classic won by Wilbur Shaw of Indianapolis. Shaw was a winner in 1937 and raced home first this year by maintaining an average speed of 115.035 mi. per hour over the 2½ mi. brick and asphalt oval course. He completed the 500 mi. in 4 hours 20 min. and 47.41 seconds. Jimmy Snyder of Chicago was second and Cliff Bergere of Hollywood, third.

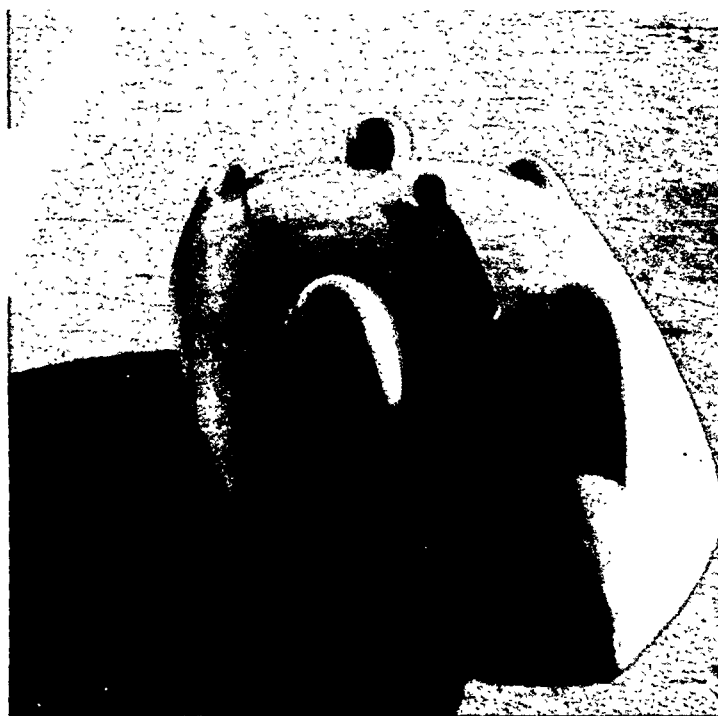
The race was marred by the death of Floyd Roberts, 39-year-old pilot from Van Nuys, Calif., and the winner at Indianapolis in 1938. Roberts, who had planned to retire from the sport after the race, lost his life in the event's first fatal accident since 1935.

In the 100 mi. A.A.A. dirt-track championship event contested at the New York State Fair in Syracuse, Mauri Rose flashed home in front. Lemuel Ladd of Boston triumphed in the inaugural running of the Montauk Grand Prix road race over a two-mile course at Montauk, L.I., in July.

Midget automobile racing continued to flourish. A 150-mile national championship contest was held in August at the revamped Roosevelt Raceway in Westbury, L.I., and attracted 55,000 fans. Morris (Babe) Bower of Philadelphia was the victor, leading Joe Garson of Great Neck by 11 seconds.

Accidents in midget events claimed the lives of several drivers, Snyder being the most prominent among them. He was killed less than a month after his fine second-place performance in the Indianapolis big-car classic. The fatal accident occurred at the Cohokis (Ill.) track on June 29. (T. J. D.)

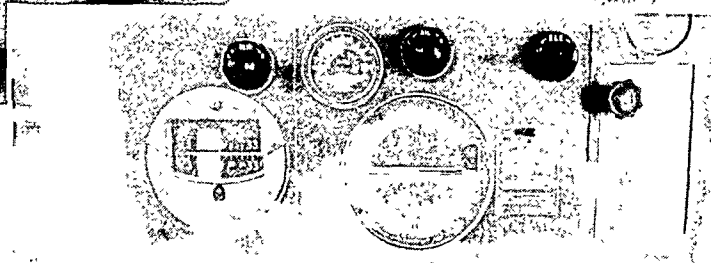
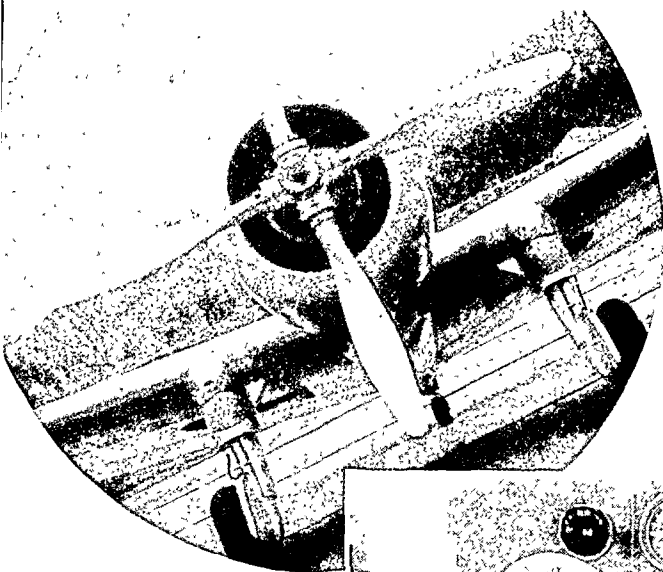
Automotive Safety Foundation: see TRAFFIC ACCIDENTS.



THE WORLD'S LAND SPEED RECORD fell again in 1939 as John Cobb sped over the course of Bonneville Salt Flats, Utah, August 23 at 368.85 m.p.h.

Aviation, Civil. Transport.—Airlines of the United States, Canada, and certain other countries continued their growth through 1939 but the outbreak of war in Europe caused drastic changes in many of the services operated over that continent. Plans for crossing the North Atlantic to the United States and Canada were also affected. Pan American began its regular transatlantic service in May of 1939 and has continued this operation, but Imperial Airways operated a service over this route for only a short time before the war caused its suspension. Deutsche Lufthansa, which had also planned a North Atlantic service and made extensive survey flights in 1936-1938, was forced to suspend its South Atlantic and many of its other foreign services as soon as the war began. Pan American still has the greatest route mileage of any organization (62,889 mi. in Oct. 1939) and, as the new European war began, Lufthansa was operating in Germany what was the most complete internal network of airlines existing under one head in any country. The Russian lines claim the greatest volume of freight while the United States domestic routes handle the largest number of passengers and, so far, the greatest volume of mail. The plan of sending all first class mail by air without extra charge began in Europe several years ago and was growing with surprising rapidity until the war interrupted. By far the most ambitious of the plans along these lines was the British "Empire Air Mail Scheme," which provided for linking of the entire empire with air routes carrying first class mail at ordinary rates. Formulated several years ago by the British Government in co-operation with the colonial governments, the first stage of this plan went into operation in June 1937 with service between England and South Africa. Services between England, India, and Malaya followed in Feb. 1938; extension to Australia and New Zealand came later in the year. Transatlantic service to Canada via the United States followed in 1939 but, as noted above, was later suspended by Imperial Airways on account of the war. About the same time the whole plan of carrying "all first class mail by air without surcharge" was shelved for the present. A change of economic importance took place in 1938-1939, when the growth of traffic put most airlines of the United States on a profitable basis for the first time.

Flying equipment of most airlines has shown a pronounced



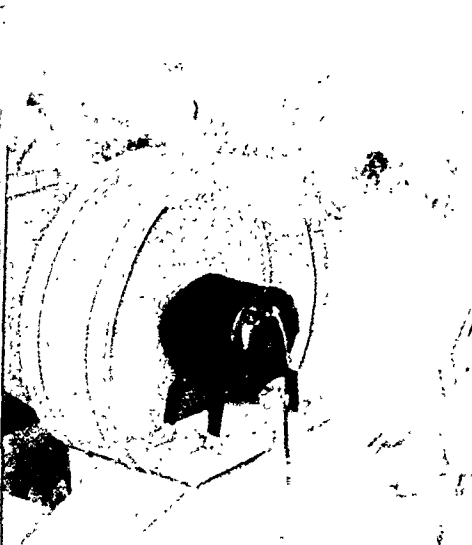
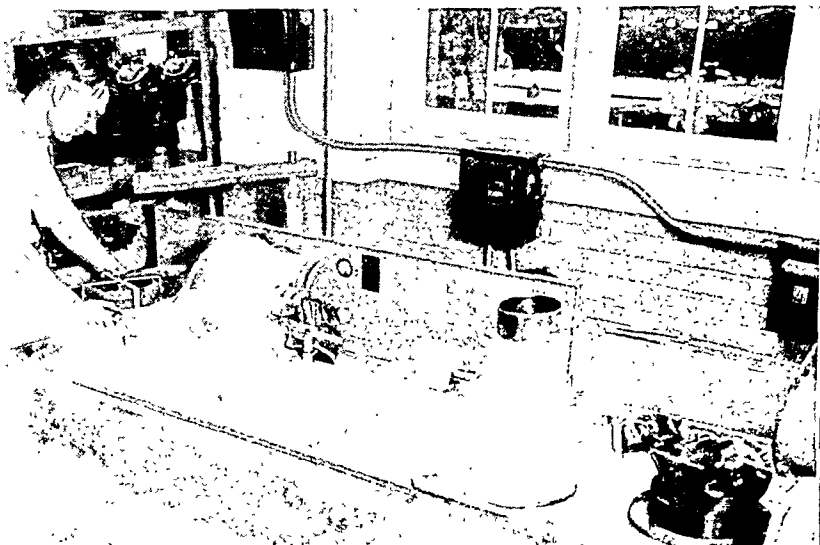
Left circle: THE FIRST FOUR-BLADED CONTROLLABLE PROPELLER for American transport and military planes was announced July 15, 1939

Right circle: THIS STATIC SUPPRESSOR, announced Jan. 14, 1939, permits normal reception of directive-beam and voice-radio signals during flight, regardless of the intensity of static

Above: A "TELL-TALE" DEVICE announced in Feb. 1939 for a new U. S. stratoliner automatically checks the operation of all instruments and vital parts of the plane

Below, left: MAGNA-FLUX SYSTEM for testing cylinder heads of aeroplane motors, perfected in 1939

Below, right: U.S. COLLEGE STUDENTS studying a wind tunnel as part of the courses begun in 1939 by the U.S. Gov't to create a civilian air reserve



tendency toward increased size in the past few years. Before the war began, Lufthansa was flying a number of 40-42 passenger Junkers airliners on its routes; the German firm of Blohn & Voss was reported to be constructing a 100,000-lb. long-range flying boat and the Russian Government had completed a 64-passenger landplane of about the same weight. Short Brothers had built 74,000-lb. flying boats for Imperial Airways' ocean routes and Air France Transatlantique had on order two 132,000-lb. flying boats. In the United States in 1938 Douglas produced the first of the DC-4 series, a 42-passenger land type and Boeing completed the first No. 314, a 74-passenger flying boat for ocean use. Several countries have been giving consideration to the so-called "sub-stratosphere" or high-altitude flying and craft designed for such use have been put into production in the United States. Advantages claimed for high-altitude operation are mainly those of encountering better flying weather, and of attaining higher speeds if supercharged engines are used.

General Commercial Development.—Although dwarfed by the rapid growth of air transport, other civil aviation continued to grow steadily. Aeroplanes in the hands of individual owners are not yet as common as some enthusiasts had expected, but they are now increasing, more particularly in the United States. In 1938, control of civil aviation in the United States was transferred from the Department of Commerce to the Civil Aeronautics Authority, a new body created for this purpose. Among its plans to foster civil aviation, this body put an ambitious pilot training plan into effect in 1939. This plan provides for payment by the Government of all flight training cost while the student pays most of the cost of the ground schooling. Under the impetus of this plan, flight instruction increased rapidly and by Nov. 1939 there were 29,513 licensed pilots in the United States. About the same time, the new European war brought large-scale construction of aircraft in the warring countries and caused renewed interest in military aviation in the United States. All of these factors combined to produce a very distinct "boom" in aircraft construction in the United States as well as in the countries at war.

Technical Development.—Rapid progress continued through 1939 in most branches of aeronautics. The renewed interest in rotating wing aircraft (which began several years ago) continued, and the U.S. Post Office awarded a contract for experimental use of autogiros to carry mail between the roof of Philadelphia Post Office and Camden airport. Service under this contract began in the summer of 1939 and has been operated successfully to date.

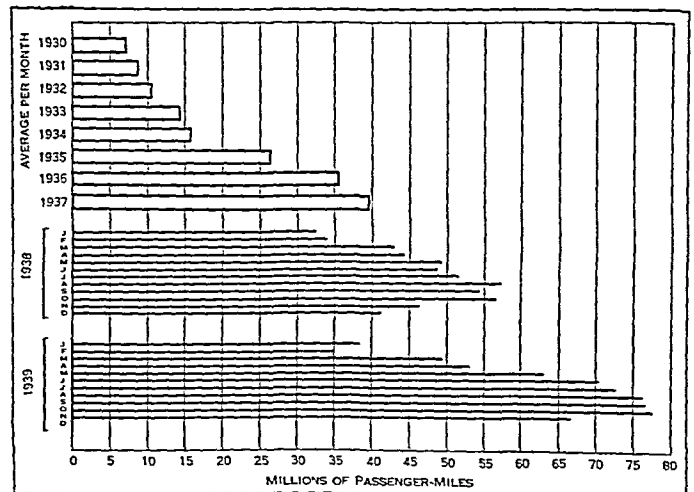
Aeroplanes still increase in size, and among the large transport types recently built are the Douglas, Boeing, Junkers, and Short Brothers craft already mentioned. When the war began in 1939, Latecoere was developing for transoceanic use a tremendous flying boat, which was reported to weigh 145,000 lb., and several firms have investigated the possibilities of still larger types. In 1938, Pan American obtained from Douglas, Consolidated, Martin, and Sikorsky, bids on long-range flying boats to carry 100 passengers but, to Jan. 1940, had not yet placed any orders for these. Consolidated carried its studies even farther, by investigating possible size limits, and its engineers reported as possible a 12,000 h.p. aeroplane to carry 300 passengers, a crew of 30, and to weigh about 400,000 pounds. Others made studies of possible speed limits, which seem to indicate that present racing speeds are close to the theoretically possible limits without some revolutionary advances in aerodynamics. The U.S. National Advisory Committee for Aeronautics, in particular, is working upon the problem of developing a wing form that would increase present theoretically possible speeds. Military craft are already being built for which speeds of as much as 435 m.p.h. are claimed, but censorship prevents more detailed and authentic information from being available. In transport, however, such performance is

barred by prohibitive cost of operation, and higher speeds are more likely to be attained by the use of higher altitudes of operation. Constructors are now building such transports for operation at 15,000 to 20,000 feet. These have cabins braced for internal pressure so that the air within can be maintained at the pressure normally encountered at lower heights. Boeing and Curtiss-Wright have already produced their first of this type, and the former was started into production in 1939.

Much was accomplished in the way of making air travel more comfortable for the passenger during the past few years. Almost all airliners now have sound-insulated walls, controllable ventilation, satisfactory heating, and adjustable seats in the case of long flights. Numerous airliners in the United States now have sleeping berths, but this plan has not been followed elsewhere, on account of the lesser distances involved. In a few cases, oxygen supply has been provided for passengers and crew when crossing high mountain ranges, but this still remains exceptional.

Engine Development.—Progress in engines was mainly along the lines of greater reliability and larger unit size, but progress was also made in fuels with higher anti-knock properties which permit the use of higher compression ratios and some consequent increase in engine efficiency. Diesels have been disappointing to date and, with the improved fuel efficiency obtainable with higher compression in gasoline engines, the advantage of the diesel has been distinctly lessened. Germany remained practically alone in continuing aviation diesel development and, even there, the recent trend has been away from this type. Lufthansa has had a considerable number of diesel-engined transports in service and found that maintenance costs ran high; original cost as well as weight exceeded that of the gasoline engine, and local overheating troubles were encountered. Just before the war disrupted technical news sources, it was claimed that these problems had been practically solved. Fuel economies of the diesel have not been sufficient to offset other objections and lack of diesels in large sizes has been another factor contributing to their decline in favour. Aircooled gasoline engines have now reached 2,000 h.p. in size and have thus far surpassed what was believed to be the practical limit a few years ago. In the past few years, a two-speed supercharger was produced by the Wright Corporation, the primary intent being to provide moderate supercharging for take-off and full supercharging for high altitudes.

Components and Accessories.—Aluminium alloy, steel-and-aluminium alloy, and all-steel, have almost completely superseded wood-and-metal in aeroplane construction, excepting for small craft and some special cases of larger ones. Retractable landing gears have become practically standard in transport types and



TRAVEL BY AIR in the United States: passenger-miles flown on scheduled airlines (revenue and non-revenue)

**Domestic and Foreign Air Transport Traffic
of U.S.A. Air Routes**

Year	Passenger-miles Domestic Routes Monthly Average	Passenger-miles Foreign (U.S.A.) Routes Monthly Average
1930	7,001,216	1,644,806
1931	8,870,200	1,127,183
1932	10,586,566	1,626,149
1933	16,124,343	2,108,997
1934	15,654,886	3,284,078
1935	26,158,702	3,888,660
1936	36,311,688	4,666,983
1937	39,716,930	6,085,437
1938	46,493,272	6,486,409
1939	57,167,000*	7,975,000*

* Last few months of year estimated.

some recent designs provide a third wheel in the front to prevent nosing over when too much pressure is applied to the brakes. "Feathering" propellers have been developed by Ratier in France, and by Hamilton and Curtiss in the United States; the Hamilton propellers have been installed on some United Air Lines transports, being thus the first to find their way into commercial service. These propellers have several advantages. By adjustment of the blade angle to suit the operating condition, climbing rate is improved and economy is bettered at nearly all speeds. In multiple-engined craft flying with one engine "dead," performance is improved, as the blades of the "dead" propeller can be set to the "no thrust" position and its resistance decreased. Some of the latest propellers can be turned to "reverse" position, permitting use of the engine power to make a short stop after landing.

A new type of homing compass was produced by Sperry in 1938. This has an index finger which points directly toward any radio station upon which the apparatus is tuned, thus leaving the pilot free to use his earphones for other messages. The device does not require radiobeacons as it can be arranged for tuning in on a broadcasting station. Probably the most important instrument development of recent years is the "terrain clearance indicator," operating on the radio reflection principle, and which has been under development for several years. Its perfection was announced during 1938 by the Bell Telephone Laboratories and United Air Lines. The apparatus emits a radio wave and measures the time required for its reflection, the dial being calibrated to indicate directly the number of feet distant from the object

NINETEEN-FOOT PRESSURE TUNNEL of the National Advisory Committee for Aeronautics at Langley Field, Va., shown for the first time May 2, 1939, to a visiting group of scientists

Traffic Statistics of the Two Leading International Air Transport Systems

Year	Passenger miles flown in year by	
	Pan American Airways*	Imperial Airways
1933	27,500,000	20,228,000
1934	41,009,280	22,411,000
1935	53,265,844	30,825,000
1936	66,661,462	27,021,000
1937	85,776,389	35,396,000
1938	87,636,601	40,000,000†
1939	105,400,000‡	See note

* All Pan American figures recalculated since last year.

† Estimated on basis of first nine months.

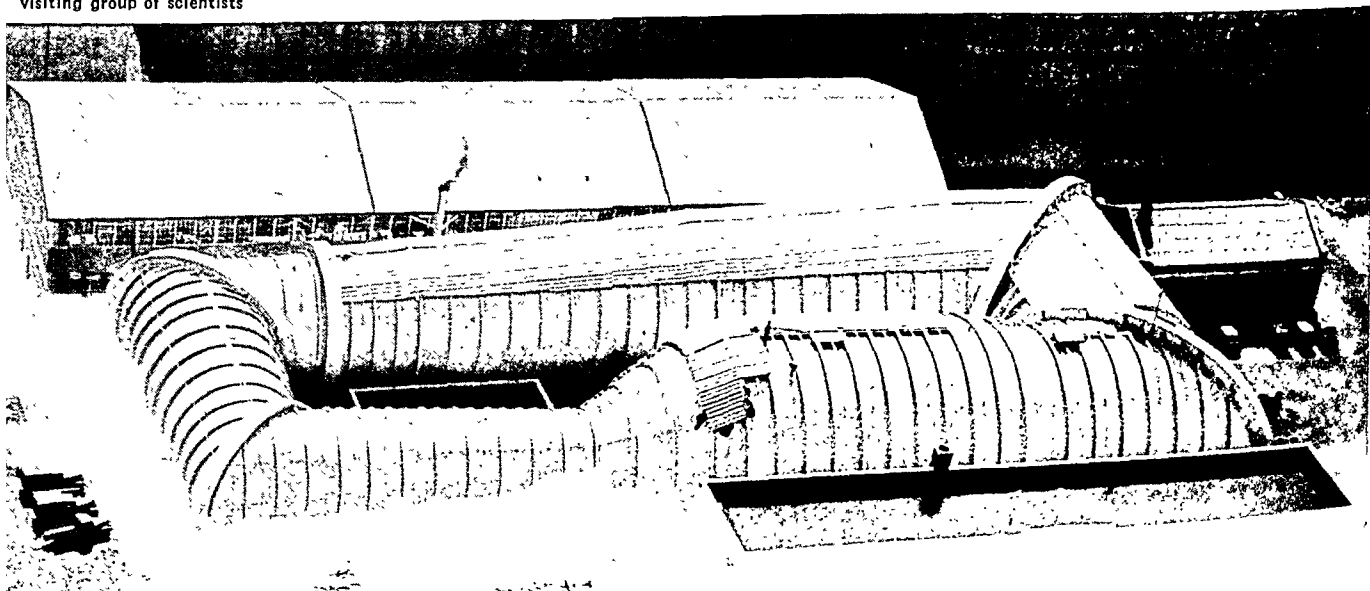
‡ Preliminary calculation.

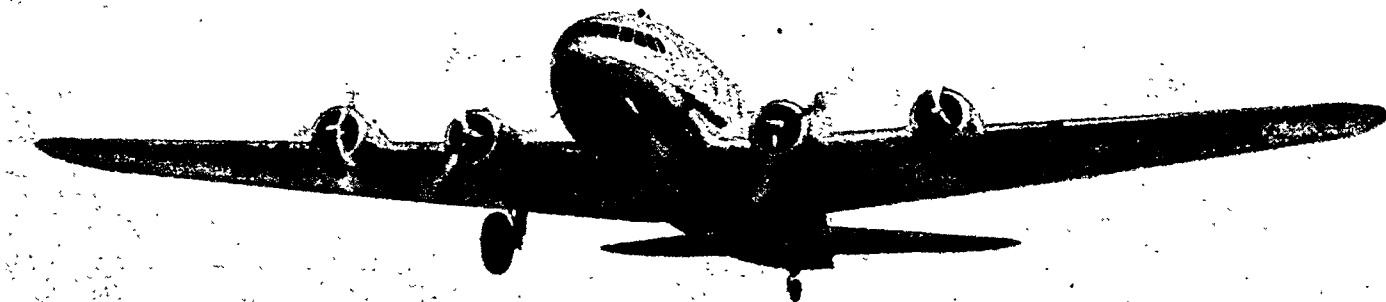
Note:—Imperial Airways flew 8,743,856 passenger-miles in first three months of 1939. Drastic changes resulting from war effects preclude estimate of total for entire year.

causing the reflection. Demonstrations made in the latter part of 1938 showed the sensitivity and accuracy of the device to be almost uncanny. Every change in terrain below is faithfully shown, even to the extent of indicating clearance over structures passed in the flight.

De-icing equipment, which was developed in the United States a few years ago, and which has been regulation equipment on airliners there for some time, is now receiving world-wide acceptance. For a time, experiments with ice-preventive pastes were conducted in England and on some continental European airlines, but these have not proved as efficient as the mechanical de-icers. Icing of wings is serious, because it destroys lift by adding dead weight and affecting the aerodynamic efficiency of the wing, as well as interfering with the free operation of control surfaces. Many expedients have been tried but none has been so successful as the method of applying inflatable rubber coverings to the leading edge of wings. Normally, these bags lie flat upon the wing surface and, being treated with an oil, they retard the collection of ice particles in the first place. If the formation is persistent, the pilot brings into operation an apparatus which automatically inflates and deflates the bags at intervals, thus breaking loose any ice particles as rapidly as formed. For use on propellers, other apparatus has been devised to throw a liquid out on the blades to prevent ice from adhering.

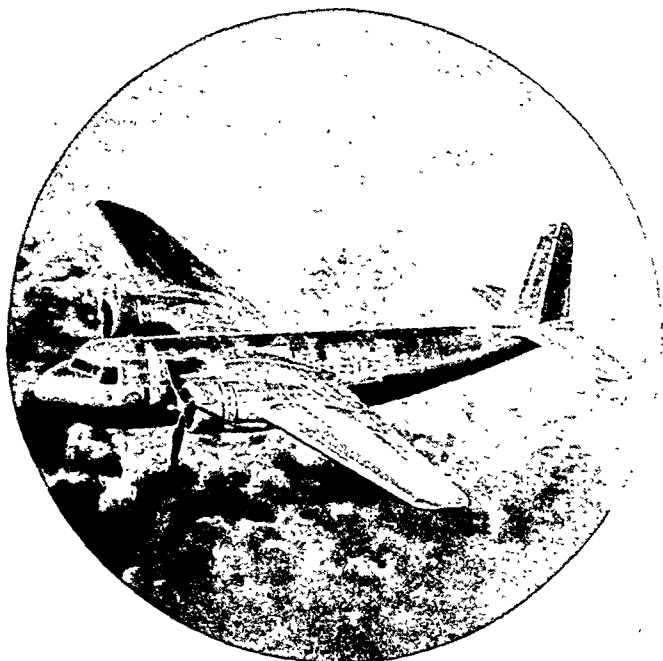
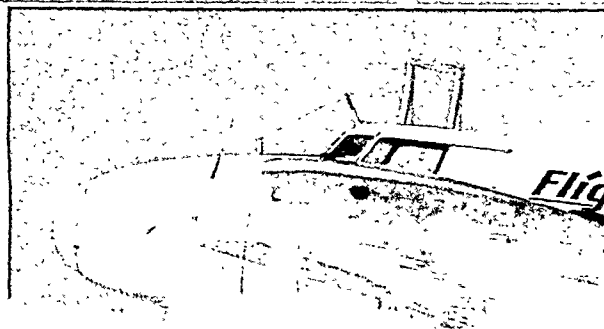
Records.—The year 1939 witnessed several new records. The speed record for aeroplanes was moved to a new high in April, when Fritz Wendel flew for a short distance at the rate of 469 m.p.h. in Germany. Wes Carroll and Clyde Schlieper moved the maximum time in flight up to 726 hours, picking up fuel in cans,





Above: BOEING 307 STRATOLINER, first commercial plane built for flight at altitudes up to 20,000ft., underwent its initial full test July 8, 1939

Right: NEW TYPE OF RADIO ANTENNA mounted directly above the cockpit windows on a "flight research" airliner

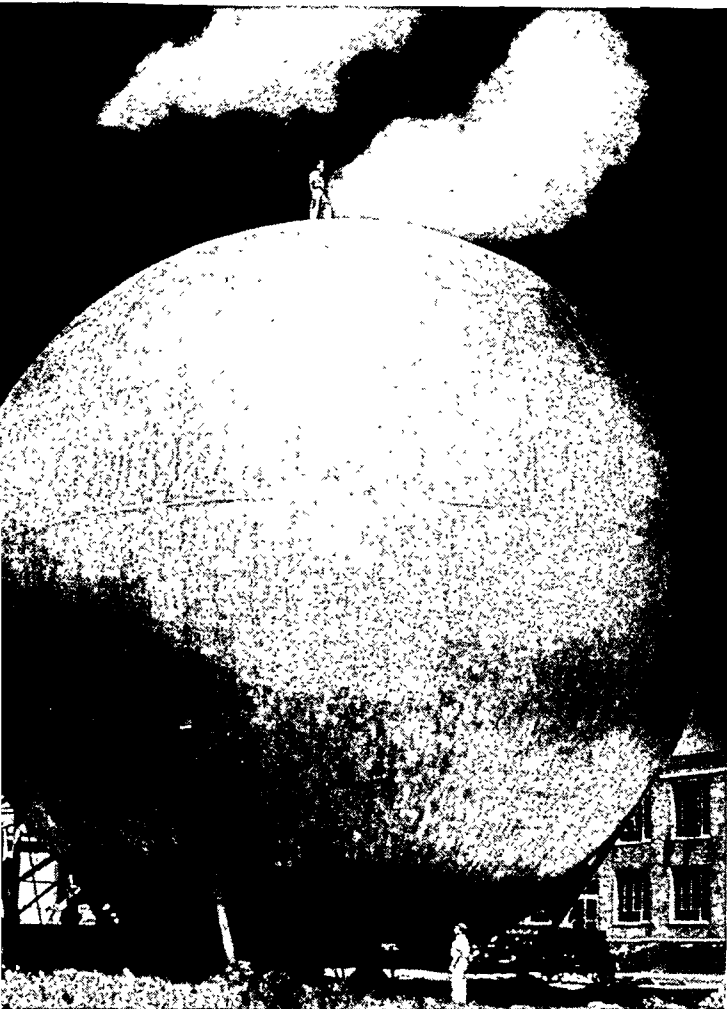


Above: NEWEST DOUGLAS AIRLINER, the DC-5 on a test flight in March 1939 with one motor cut out

Right: COMPARTMENT in the "Yankee Clipper," transatlantic flying boat of Pan American Airways

Below: BOEING CLIPPER, the plane used on Pan American Airways' transatlantic passenger service, inaugurated June 28, 1939





SPHERICAL FREE-FLIGHT WIND TUNNEL of the National Advisory Committee for Aeronautics, first shown publicly on May 2, 1939

during their flight near Long Beach, Calif., in Oct. 1939. The highest altitude ever attained by man is still the one established in 1935 when Capt. Orvil Anderson and Albert Stevens of the U.S. Army ascended to 72,395ft. in a special stratosphere balloon. Gliders, or motorless aeroplanes, have continued to provide surprises in recent years. A non-stop glide of 50hr. and 26min. was made by A. Bodecker and K. H. Zander in a two-seater glider in Germany in 1938 and O. Klepikova, a Russian woman, established a record of 465mi. in one flight in 1939.

(See also AIR FORCES; AIRPORTS; PUBLIC HEALTH ENGINEERING: *Aviation and Mosquitoes*; GASOLINE; RAILROADS; UNITED STATES: *Aviation*.) (A. BL.)

Aviation, Military: see AIR FORCES; BLOCKADE; EUROPEAN WAR; MUNITIONS OF WAR: *Aircraft*; see also under various countries.

Azerbaijan S.S.R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Azores, The: see PORTUGUESE COLONIAL EMPIRE.

Backhouse, Sir Roger Roland Charles (1878–1939), British sea lord, was born November 24, the fourth son (a twin) of Sir Jonathan E. Backhouse. He joined the British Navy at the age of 12 and while still a youth became an expert in gunnery. He served throughout the World War and at the end of hostilities commanded a battle cruiser. From 1920 to 1922 he was director of naval ordnance. He was promoted to rear admiral in 1925,

vice-admiral in 1929, and admiral in 1934; in Feb. 1938 he was named first sea lord and chief of naval staff.

Illness forced him to retire May 17, 1939 and he died shortly thereafter, on July 15.

Bacon. Of the two foods for which Great Britain will depend on North America during the war one is bacon; the other wheat. Both will be drawn largely, if not entirely, from Canada. Soon after the outbreak of war the British Food Ministry asked the Canadian Government to provide for definitive deliveries of bacon weekly, and production of bacon was at once increased greatly in the Dominion. September 1 prices of Canadian Wiltshire sides were 87s. per cwt. in England, but this price was later advanced to 95s. to cover a rise of 33% in cargo rates, 2½% in insurance and the depreciation of the pound sterling in terms of Canadian currency.

Whether the United States may be drawn on to ship bacon to the United Kingdom depends on the ability of the Scandinavian countries and Holland to maintain shipments. *The Grocer*, London, printed an unconfirmed report early in the war that Germany had agreed with Denmark not to interfere with shipments to the United Kingdom if, in return, certain supplies were provided the Reich. These are contingencies which affect possible rationing of bacon and hams in Britain, where food control was established immediately on the declaration of war and all bacon stocks requisitioned by the Government. In the World War (1914–18) governmental food control was not established until the middle of the third year of the war. Under the Ottawa agreement of seven years ago Canada was allowed an export quota to Britain equivalent to 50,000 hogs a year, but the nearest approach to that quota was 35,000 in 1937, with shipments steadily declining through 1938 and until the beginning of war in 1939.

The highest monthly production of sliced bacon in the United States was recorded Aug. 1939, when 27,289,035lb. were produced. The second highest monthly production was 24,928,665lb. in Sept. 1939, according to the United States meat inspection service. Production in the United States of sliced bacon for the 11 months ending September 30 was 241,011,969lb. in 1939 and 215,065,296lb. in 1938. Passing of the amendment to the United States Neutrality act interfered with shipments of meat to the United Kingdom since other than American ships had to be found to carry the shipments. (See also Hogs.) (S. O. R.)

Bacteriology. Recently Dubos has discovered a bacterium in the soil which is capable of killing certain types of disease germs. The micro-organism which he has described is a Gram-positive staining, spore-bearing, aerobic bacillus which is capable of disintegrating the living cells of many Gram-positive microbial species. Several of the Gram-positive species may be seen to disintegrate when incubated with the killing agent. White mice are protected with this agent against infection with large numbers of virulent pneumococci. The bactericidal agent can be obtained in an active form free of protein.

Mutation among strains of the virus of tobacco-mosaic disease has been brought about by plating out on the leaves of *Nicotiana glutinosa*. This method of isolating strains has brought further evidence of the high degree of variability of tobacco-mosaic virus.

Cultivable filterable micro-organisms have been isolated which have many of the properties of bacteria and in addition some properties of viruses. These organisms have been isolated from samples of London sewage by fractional ultrafiltration and selected colony sub-culture. The particles, when separated and inoculated into a suitable medium, can initiate the development of a typical culture.

Infantile paralysis (poliomyelitis) virus has been found to be

more readily isolated from the stools of human patients than from the nasopharynx. A carrier state appears to exist in the common mild abortive cases. In convalescence these patients may excrete the virus in the stools for three weeks after their brief illness, which practically puts them in the class of "healthy carriers."

Several strains of a virus present in the lungs of apparently normal three to four weeks old Swiss mice have been isolated. It causes a fatal pneumonia in mice when inoculated intranasally under light ether anaesthesia, but does not produce an apparent infection when injected by other routes. Some normal human sera possess the capacity to neutralize the virus. This work is of great importance in that one must be very sure, when studying other viruses in the mouse, that natural occurring mouse virus strains are eliminated.

Bacteria-like bodies found in the alimentary canal of insects and arachnids are called Rickettsiae. Certain of these Rickettsiae are responsible for cosmopolitan diseases such as typhus fever. A filter passing agent was recovered by Davis and Cox in Montana, U.S., from the Rocky Mountain wood tick, *Dermacentor andersoni*. It was found that this agent survives in and is transmitted by nymphal and adult *D. andersoni* which have ingested the virus in the larval stage; it survives through the eggs deposited by infected females and is transmitted by the progeny.

A description of this Rickettsia-like infectious agent is given by Cox. This agent was found capable of causing an infection in a laboratory worker which resembled "Q" fever of Australia. The Australian disease is an acute illness with a febrile period of from 7 to 24 days and occurs chiefly among workers in abattoirs and among dairy farmers. More recent evidence indicates that the Montana, U.S., disease and Australian "Q" fever are closely related infections.

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Badminton. Badminton not only attracted more general interest during 1939 but it also brought together more spectators for exhibition games, as well as 200 ranking players from all parts of the United States for the third annual national badminton championships, held in New York for the first time. Bill Markham, a young American professional of New York, took the measure of Jack Purcell, of Canada, the long-standing star of the English-speaking badminton world.

Following in the footsteps of many stellar California netmen, young Dave Freeman, of Pasadena (the 1938 national junior tennis champion in both singles and doubles) survived a three-day barrage of shuttlecocks to win the final round of the men's singles national championship. In doing so he dethroned Walter Kramer, of Detroit, who has held the championship since its inception in 1937. Hamilton Law and Richard Yeager were the best among the doubles contenders for the national doubles title. Among women badminton experts, Miss Mary Whittemore, of Boston, succeeded Mrs. Del Barkhuff as the national titleholder.

Europe.—The All-England championship, unofficially representing world ranking, sponsored its 36th annual competition in 1939, with the Danish entrants top winners—Tage Madsen in the

men's singles, and Mrs. Dalsgard and Miss Olsen in the women's doubles. The men's doubles title went to T. H. Boyle and J. L. Rankin of Ireland. In the ladies' singles, Mrs. W. R. Walton, of Toronto, won the title. That Canada is making rapid strides in the game was shown in the Canadian Open (amateur and professional) when George Goodwin (pro) of Ottawa won the singles title, and Paul and Jim Snyder (amateurs) of Waterloo, Ont., won the doubles crown. (J. B. P.)

Bahamas, a British colony and island group east and south-east of Florida; language, English; capital, Nassau (pop. 19,756); governor, Sir C. C. F. Dundas; area 4,375 square miles. The population (1931 census: 59,828) was officially estimated at 67,720 in 1939. The Government is administered by an appointed governor and legislative council and an elected assembly.

Outbreak of the European war in Sept. 1939 was met in the Bahamas by legislative action putting the colony on a war footing, imposing a censorship, and appointing a food control committee to regulate prices and food distributing. The colony has cable and radio communication with the outside. In 1939 a modern dial-telephone system (costing nearly £70,000) was completed at Nassau. Tri-weekly air communication (daily in winter) is maintained with Miami. Normally, five steamship lines call regularly, but owing to disruption by war conditions, the Government was compelled, in Nov. 1939, to subsidize a United States line to maintain service through the winter. In a further effort to encourage tourist trade, passport regulations were waived. The tourist trade, valued at £1,000,000 annually, is the most important factor in the colony's economy, and, with increasing real estate investments, offsets the unbalance of trade. In 1938 imports were £1,138,839 and exports (including £64,688 re-exports), £213,135. Imports were derived: from the British Empire, 42.32% (Great Britain, 23.8%; Canada, 11.48%); United States, 44.76%. The British Empire took 57.74% of exports (Great Britain, 28.29%; Canada, 24.38%), the United States, 23.12%, the Netherlands, 9.37%. Imports are flour, meats, and other foodstuffs, and miscellaneous manufactured goods. In 1938 sponges comprised 60% of domestic exports, tomatoes (exclusively to Canada), 17%; lumber, 6%; crawfish, 4.5%. Hemp production was less than 1% in 1938 (4% in 1937). These products, along with fish for local consumption, constitute the chief products. The monetary unit is the pound sterling. Education is compulsory. In 1938 there were 119 elementary schools (including 57 Government-aided private schools), with an enrolment of 12,896. Education is allotted approximately 5% of the colony's budget (£30,037 in 1938). (L. W. BE.)

Bahrein Islands: see BRITISH EMPIRE.

Baker, Thomas Stockham (1871-1939), U. S. educator, was born on March 23 at Aberdeen, Md., and was educated at Johns Hopkins university and the University of Leipzig. He was associate professor of German at Johns Hopkins from 1895 to 1900 and lecturer on German literature there from 1900 to 1908. During this time also he was music critic of *The Baltimore Sun*. From 1909 to 1919 he was director of the Jacob Tome institute at Point Deposit, Maryland. In 1919 he became secretary of the Carnegie Institute of Technology at Pittsburgh, and was president from 1922 to 1935. An authority on scientific methods of coal production and research, he was interested also in international affairs and lectured widely in the U.S. and Europe. He died at Pittsburgh April 7.

Baker Island: see SOUTH SEA AND EQUATORIAL ISLANDS.

Balance of Trade: see EXPORTS AND IMPORTS; INTERNATIONAL TRADE.

Balkan Entente. The Balkan Entente is an instrument of co-operation of Greece, Rumania, Turkey, and Yugoslavia for the maintenance of peace in the Balkan peninsula. It was primarily aimed against the revisionist claims of Bulgaria which demanded the return of territory lost to Rumania, Greece, and Yugoslavia. With the rapid deterioration of the international situation since 1938, efforts were made to turn the Balkan Entente into a closer alliance of the four Balkan countries, so as to oppose a united front to any expansion of Germany or Italy into the Balkan peninsula. To this end the co-operation of Bulgaria was sought. The Italian occupation of Albania in the spring of 1939 increased the fears of the Balkan countries lest Italy might use the newly acquired foothold in the peninsula for exercising strong pressure upon Greece and Yugoslavia. The conclusion of a firm alliance was, however, hindered by the mutual jealousies among the Balkan countries themselves, by their unwillingness to meet at least some of Bulgaria's demands, and by their inability to face courageously by common action a possible future danger to the security and existence of all of them. To become effective, the Balkan Entente would have to be transformed into a bloc of countries committed to promises of mutual and automatic assistance. Whereas Rumania, feeling herself most threatened by German pressure and by territorial demands on the part of the Soviet Union, of Hungary, and of Bulgaria, favoured such a development, Yugoslavia, although bound to Rumania by a defensive pact in case of attack on the part of Hungary or Bulgaria, was opposed to any tightening of her obligations.

The latter part of 1939 saw an easing of the tension between Italy and Greece by the exchange of formal letters between the two Governments on November 2, confirming friendly relations and their desire to contribute to the preservation of peace in the southern Balkans. On the other hand, the active entrance of the Soviet Union into European politics on the side of Germany increased the tension in Rumania and in Turkey, both of which feared possible Soviet demands on their territories. Bulgaria, where many of the younger elements have Communist and many of the older politicians Pan-Slav sympathies, both centring on Soviet Russia, felt herself encouraged by Russian designs upon the Balkans. Hungary, which pressed her demands for Transylvania upon Rumania with increased insistence, was restrained, however, by her fear of any Soviet advance along the Carpathian mountains and sought Italy's assistance, both in her claims against Rumania and in her protective measures against the Soviet Union. Italy and Hungary tried to win Yugoslavia to their side and to disintegrate, by an Italo-Hungarian-Yugoslav alliance, the Balkan Entente. Count Ciano, the Italian foreign minister, expressed in his speech of December 16 Italy's opposition to the formation of a Balkan bloc. Great Britain, France, and Turkey favoured the formation of a Balkan bloc with a stabilizing influence on the peace in southeastern Europe, but at the end of 1939 the Balkan Entente seemed no nearer to this goal than in 1938 and was in danger of undergoing the same fate as her counterpart, the Little Entente. (H. Ko.)

Ballet: see DANCE.

Ballroom Dancing: see DANCE.

Baltimore, metropolis of Maryland. Area 91.93 square miles. Population (1939) 868,990 of which 173,482 were Negroes. Total population 1938, 862,059. The city ranks eighth in population among cities of the U.S. Birth rate per thousand 1939 (11 months) 14.6, 1938 (12 months) 15.3. Death rate 1939 (11 months) 12.1, 1938 (12 months) 12.3.

History.—Mayor Howard W. Jackson and comptroller R. Walter Graham were re-elected to office; Richard C. O'Connell was

elected president of the City Council. All terms expire May 1943. A loan of \$2,000,000 for schools and one of \$1,000,000 for completing the municipal airport were approved by the electorate but proposed loans for the extension of sewers and paving failed of indorsement. A system of permanent registration of city voters was inaugurated.

Education.—Enrolment in public elementary and high schools (1939) was 112,050 of which 22,190 were Negroes; for 1938 the figures were 116,234 and 30,370 respectively. Roman Catholic elementary and high schools had 35,248 pupils, an increase of 2,204.

The number of students in private schools was 3,258.

Finances.—Bonded indebtedness (Nov. 1939) \$184,263,579, (Nov. 1938) \$182,081,579. Appropriation for 1940 from the tax levy is \$51,051,936, an increase of \$2,208,579. Approved expenditures for special purposes from existing and tentative loans raised the total amount for 1940 to \$61,759,097. Taxable basis 1940 \$2,225,091,796, a decrease of \$408,561. Tax rate 1940 \$2.80 per \$100, an increase of 15 cents; \$1.10 represents debt service; 79% of the city's debt has been created since May 1919 during the terms of two mayors.

Funds available for public works \$5,500,000.

Trade and Manufactures.—Foreign trade for the first nine months of 1939 amounted to—exports \$62,857,959, (same period 1938, \$63,051,924); imports \$46,245,131, (1938, \$50,123,501). The value of manufactured products in the Baltimore industrial area in 1937 in 1,835 plants was \$925,760,636. (Ed. EL.)

Bananas. Disruption of ocean traffic consequent to the declaration of war did not in 1939 interfere with banana shipments as severely as in the World War or to the extent banana growers had anticipated. The Swedish fruit market was without bananas for two weeks, but the authorities then arranged for two Norwegian steamers to bring in shipments every 14 days to Gothenburg. In Jamaica banana growers early in the war suspended spraying for leaf spot, under the misapprehension that war would so greatly curtail the market the expense of spraying was useless. Spraying, however, was resumed as shipping continued to be fairly regular. More disastrous than war, to Jamaica banana plantations, was the violent wind and rain storm of Nov. 3, 1939, the worst since 1903. Official reports said 75% of the trees were damaged. Unofficial estimates, through consular reports, said 2,000,000 stems were destroyed and between 18,000,000 and 20,000,000 plants blown down. Banana shipments from Jamaica from Jan. 1 to Oct. 21, 1939, were 17,254,091 stems, compared to 20,361,708 stems for the full calendar year of 1938. Shipments from Guatemala the first nine months of 1939 were 7,702,741 stems, compared to 7,598,756 in the same period in 1938. Costa Rican shipments were 2,345,714 stems the first eight months of 1939 and, correspondingly, 1,879,324 in 1938. Haiti shipped 2,029,767 stems the year ending Sept. 30, 1939, and 1,363,176 the preceding year. Panama shipments the first six months of 1939 were 2,949,738 stems. Heavy damage from storms in August curtailed subsequent shipments. The 1939 crop of the Dominican Republic was placed at 1,000,000 stems in consular reports. (S. O. R.)

Bankers Association, American: see AMERICAN BANKERS ASSOCIATION.

Bank for International Settlements. The growing tension in Europe culminating in the outbreak of war in the autumn of 1939 naturally affected the bank's activities and provided the main explanation for the reduction in the total of the balance sheet

from 606,500,000 Swiss gold francs at the end of the fiscal year on March 31, 1939, to 459,600,000 Swiss gold francs at the end of Nov. 1939. As central banks for security reasons proceeded to convert exchange balances into gold or had to employ these balances for payments abroad, the amounts which could be entrusted to the Bank for International Settlements on deposit account necessarily shrank. The volume of transactions handled by the bank—mostly purchases and sales of gold for central banks—has, however, not diminished in the same degree as the balance sheet total. The bank's services have continued to be utilized especially by central banks in smaller countries, who from time to time must procure currencies to meet foreign payments or wish to convert currency balances into gold or request the bank to transfer gold for their account from one centre to another. Under Art. 37 of its statutes the Bank for International Settlements can only carry out transactions to which the central bank in the market concerned does not object, which ensures that the Bank for International Settlements must act in conformity with the central bank policy pursued in the different countries.

The outbreak of war naturally brought to an end business between belligerent countries as well as other operations prohibited by Trading with the Enemy Acts and similar war restrictions. Although the meetings of the board of the bank were suspended in the autumn of 1939, the president, as the chief executive at the seat of office in Basle, kept in touch with the various members of the board individually as to the main lines for the conduct of the bank while the war lasts. In the early spring of 1939 Dr. J. W. Beyen intimated to the board his intention to resign as president and in June Mr. McKittrick, a United States citizen with long experience of banking in various European countries, was appointed his successor, beginning his term of office on Jan. 1, 1940. The result of business operations for the financial year ending March 31, 1939 showed a profit of 8,544,000 Swiss gold francs compared with 9,012,000 Swiss gold francs in the preceding financial year. A 6% dividend in gold has again been distributed and the usual allocation has been made to reserves, which on March 31, 1939 were 24,300,000 Swiss gold francs compared with a paid up capital of 125,000,000 Swiss gold francs. (P. JN.)

Banking. Continued growth in deposits occurred during 1939 in the banking system of the United States, chiefly due to further large imports of gold to the U.S. from war-torn Europe, and to continued financing of the Government which again operated at a substantial deficit. The number of banks in operation varied slightly from the previous year, standing at 15,082 on June 30, 1939, the latest date for which complete figures are available, as against 15,287 on June 30, 1938. Deposits, however, stood at \$55,992,000,000 an increase of \$3,797,000,000 over the figure of \$52,195,000,000 shown a year earlier.

The most important of the total number of banks are those which are members of the Federal Reserve System, whether National or State banks or trust companies. These numbered 6,330 with deposits of \$38,027,000,000 and constitute the backbone of the commercial banking system. The growth in deposits referred to above occurred primarily in this system, which accounted for a gain of \$3,281,000,000. Reserves of member banks with the Federal Reserve banks reached an all-time high during the year, excess reserves on Oct. 18, 1939 standing at \$5,509,000,000. At the same time gold stock in this country had accumulated to the record-breaking figure of \$17,000,000,000. (For activities of the Board of Governors of the Federal Reserve System and the Treasury in the field of money and credit control, see FEDERAL RESERVE SYSTEM.)

The rate of business activity as reflected in the turnover of bank deposits did not keep pace with the increase in deposits.



THE REICHSBANK after Hitler's assumption of complete financial authority June 16, 1939, as seen by Russell of *The Los Angeles Times*

Loans and investments increased during the first half of 1939 but the rates of interest earned on them decreased. This trend was reversed temporarily during the second half, with the growth in volume of commercial loans in August and the outbreak of the European war in September. Considerable selling of Government obligations occurred in September, resulting in lower prices and higher yields, but such holdings were replaced later in the year when total holdings of Governments by member banks again stood at or near record levels. While most of these holdings were of short maturities, there was a tendency to lengthen the average maturity as reinvestments were made. The relative proportion of shorter term obligations was greater in New York city banks than in reserve city banks and greater in reserve city banks than in country banks. Taking direct and fully guaranteed obligations together, the proportion of those with maturities of 5 years or less to the total was 56% at New York city banks, 36% at reserve city banks, including Chicago, and 32% at country banks.

Earnings of member banks of the Federal Reserve System showed an increase for the year ended on June 30, 1939, due to the sharp lift in earnings for the last half of the period. An analysis of these earnings shows that current operating earnings and expenses were relatively stable and that the increase resulted primarily from larger profits on sales of securities and smaller charge-offs on loans. Recoveries, profits on securities sold, and similar items exceeded total losses and depreciation for the first time since 1936. Trust department earnings, commissions, and service charges on deposit accounts continued to be considerable factors, amounting to about 14% of total current earnings.

Future expenses will be somewhat increased by an amendment to the Social Security Act which provides that all member banks will be subject to the Act after Jan. 1, 1940.

Following the outbreak of the European war in September, President Roosevelt proclaimed, under the Neutrality Act of 1937, that a state of war existed between France, Germany, Poland, the United Kingdom and associated Commonwealths, thus prohibiting the extension of certain credits to these nations. However, the

President authorized the exemption of ordinary commercial credits of a character customarily employed in peace time commerce. The Federal Reserve Board authorized advances to non-member banks on Government obligations at par at the rates prevailing for member banks. The banks did not experience any drain of funds and no demand developed for such advances.

Legislation affecting banking included the extension of the period during which direct obligations of the United States may be used as collateral security for Federal Reserve notes to June 30, 1941. Congress also repealed the requirement that all State banks having average deposits of \$1,000,000 or more in 1941, or thereafter, must become members of the Federal Reserve System in order to have their deposits insured by the Federal Deposit Insurance Corporation. This Governmental institution now insures 13,569 banks.

The Trust Indenture Act of 1939, approved August 3, contains far-reaching requirements, limitations, and restrictions relating to trust indentures under which certain securities are issued and sold in interstate and foreign commerce and through the mails. It is not yet known to what extent the banks and trust companies who customarily act as trustee of bond issues under such indentures will have to revise their practices, but considerable changes undoubtedly will be required to meet the increased duties placed on such trustees which will in turn require the imposition of increased fees. The Federal Reserve Board postponed to Feb. 1, 1940, the operation of the Clayton Act of 1935 prohibiting interlocking bank directorates. In a study presented in answer to frequent requests for congressional action to provide stabilization of prices through monetary control, the Federal Reserve Board concluded that prices cannot be controlled by changes in the supply of money. (See also BONDS; FEDERAL LAND BANKS.)

Great Britain.—The principal new development affecting the British banking system in 1939 was the outbreak of war in September, the shock of which was lessened by preparations induced by the failure of the Munich Pact. After some recession in mid-year, commercial bank deposits showed a gain for the 12 months ended October 31, from £2,256,000,000 to £2,327,000,000. Loans and securities showed an increase. (See BANK OF ENGLAND.)

Canada.—The forces of recovery at work in the previous year continued throughout 1939, aided by exceptional crops and improved industrial conditions only partly due to the outbreak of war in September. The Bank of Canada continued its cheap money policy, which was affected temporarily by the shock of war. The first operation of the Government in war finance was undertaken in November in the form of a loan of \$200,000,000 from the chartered banks on two-year Treasury Notes at 2%. The balances of the chartered banks with the Bank of Canada rose from \$211,000,000 to \$221,000,000 during the year ended Sept. 30, 1939, while the gold reserve increased from \$181,000,000 to \$225,000,000. Note circulation rose from \$175,000,000 to \$212,000,000. The ten chartered banks reported a successful year with improved earnings in some instances. Deposits increased from \$2,480,000,000 to \$2,524,000,000 during the year ended Aug. 31, 1939, with further increases indicated during autumn war activity. Earning assets were still preponderantly in investments, which increased during the year from \$1,409,000,000 to \$1,507,000,000 while commercial loans fell off from \$986,000,000 to \$957,000,000 in August, recovering later.

Europe.—International movements of funds continued to affect banking in 1939, particularly just before and after the outbreak of war in September. The Netherlands, which had experienced an influx of funds in 1938, was one of the countries to suffer a flight of capital in 1939, gold reserves decreasing in the year ending Oct. 31, 1939, from gl. 1,461,000,000 to gl. 1,120,000,000. With increased activity of business and the financing of war require-

ments, banks in European countries generally showed increases in deposits. The Bank of France increased its gold holdings due to repatriation of foreign funds of French citizens under the war act, further easing credit. (See BANK OF FRANCE.) The note circulation increased in most European countries.

The neutral countries feared the effect of blockades. Scandinavian countries ended the year threatened by Russia's war on Finland. The Central European countries were concerned with the British blockade of both exports and imports of Germany. Germany placed the Reichsbank under the unrestricted sovereignty of the Reich and passed numerous special measures to extend credits to industry to prosecute the war. The average yearly deficit of the Reich increased to a rate of about Rm. 15,000,000,000. Total debt increased from Rm. 20,000,000,000 to Rm. 30,000,000,000. Inflationary tendencies were evident in the use of "tax certificates" as currency, and increase in money in circulation from Rm. 6,686,000,000 in 1937 to Rm. 10,583,000,000 in Nov. 1939. (See also EXCHANGE RATES; FINANCIAL REVIEW; SAVINGS BANKS, MUTUAL.) (E. B. L.)

Bank of England. Partly, but not wholly as a result of the war, 1939 witnessed several fundamental changes in the structure of the Bank of England. As the table shows, the year opened with the fiduciary issue at £230 millions, and with the Bank's gold valued at 84s.11d. an ounce fine, a statutory price which had been in force for over a century. During 1938, however, the British Exchange Equalization Account had sustained heavy gold losses, and so in the first week of 1939 it had to take over £200 millions of the Bank's gold. This reduced the Bank's gold from £326 to £126 millions. To prevent a corresponding contraction in the total note issue, the fiduciary issue was raised from £230 to £400 millions.

The next change came two months later. A new Currency and Bank Notes Act was passed, which *inter alia* abolished the old statutory valuation of 84s.11d. per fine ounce of gold. Instead the Bank and the Treasury were empowered to value the Bank's gold at a price approximating the London market gold price of the day. This change took place on March 1, when the Bank's gold was written up to 148s.5d. per ounce, and its total value from £126 to £226 millions. This last increase permitted the fiduciary issue to be fixed at £300 millions, but the old power of varying the fiduciary issue by administrative action was retained.

On September 3 war broke out, and it was necessary to concentrate all the British gold reserves in the hands of the Exchange Equalization Account. Legislation to this effect was quickly passed, and since then the Bank has only held a nominal amount of gold to obviate a reduction in the note issue. The fiduciary issue was raised from £300 to £580 millions.

Bank of England
(£ million)

	Jan. 4	Jan. 11	Mar. 1	Aug. 30	Sept. 6	Dec. 6
Issue dept.						
Note issue	556	526	526	563	580	580
Note circulation	488	473	478	529	549	534
Gold	326	126	226	263	580	580
Fiduciary issue	230	400	300	300		
Banking dept.						
Public deposits	21	19	12	31	15	47
Bankers' deposits . . .	136	118	110	90	111	86
Other deposits	37	37	36	39	41	40
Govt. securities	71	96	99	113	124	115
Discounts & advances . .	49	22	6	6	6	5
Other securities	22	22	22	25	25	23
Reserve	69	51	49	34	31	48
"Proportion"	35.6	29.5	30.8	21.3	18.3	27.9
Gold valuation (per oz. fine)	84s. 11d.	84s. 11d.	148s. 5d.	158s. 6d.	168s. 0d.	118s. 0d.

*Only £100,000 to £200,000.

The war naturally brought several other changes. On August 24 the Bank rate was raised from 2% to 4%, this being the first change since 1932. The increase was a precautionary measure, designed to check war speculation and to force the City to put its affairs in order. The war also brought with it control over all foreign exchange transactions, and the Bank of England was made responsible for the administrative side of this work.

When the war emergency budget appeared at the end of September, this in itself was a sufficient deterrent against any desire to speculate, and so the Bank rate was reduced to 3%, on September 27. A further reduction to 2% was made on October 25. It had been expected that this second reduction would be delayed until the first war loan appeared, to provide a stimulus to the investor. The authorities, however, desired to restore a regime of cheap and plentiful money, both to promote confidence and to keep down the cost of Government borrowing.

The war has led to some expansion in the note circulation, especially in the early days. Fear of the dislocation of business due to air-raids induced both the commercial banks and the public to hold more currency than usual. Evacuation and the payment of the armed forces also increased the demand for currency. By November some of these influences had ceased and the circulation was back to £528 millions. The December growth was the normal seasonal movement. The fiduciary issue has been fixed enough to maintain an adequate reserve of notes in the banking department, while the banking department is also holding sufficient securities to keep bankers' deposits at a reasonably high level. The latter, however, are subject to wide fluctuations, owing to the lack of complete synchronization between the heavy Treasury Bill payments and maturities necessitated by war finance; still on the whole the Bank is maintaining an abundant supply of credit.

(N. E. C.)

Bank of France. Up to the outbreak of war, the French financial position underwent a distinct improvement during 1939. Confidence had been restored by the financial reforms of the autumn of 1938, and there was a marked repatriation of French funds and gold. The Bank of France benefited accordingly. In April and again in August 5,000,000,000frs. of gold were transferred from the reinforced resources of the French Exchange Fund to the gold reserves of the Bank of France, making a total accretion of 10,000,000,000 francs. By August the Bank of France held 97,266,000,000frs. (£550,000,000 sterling) of gold.

The war brought with it new problems. On the outbreak of war general uncertainty and other causes were responsible for a growth in the note circulation, and also in additional borrowing by the public and financial circles from the bank. This last is shown by the growth in bills discounted and 30-day loans. As the war progressed, the French Government had to borrow from the bank, and a fresh class of provisional advances made its appearance, rising to 14,750,000,000frs. (£85,000,000 sterling) by the end of the year. War expenditure equally caused a further expansion in the note circulation to 152,969,000,000frs. (£870,000,000 sterling) by the end of the year.

The ratio of gold to sight liabilities remained at the adequate level of 58.0%.

Bankruptcy. With business failures on the wane in 1939, legislative activity in this field likewise subsided, and the year saw but one new chapter added to the Bankruptcy Act (Chapter XV; Public No. 242, 76th Congress, 1st Session). Reflecting the continued plight of railroads, the chapter, which is to expire within a year, sanctions bond maturity extensions and interest reductions for roads deemed not in need of thoroughgoing

reorganization. As in other bankruptcy reorganization statutes, the machinery of composition is utilized to bind minorities to acquiescence, but while the chapter subjects plans to some scrutiny by the Interstate Commerce Commission and the approval of the Federal court, it is lacking in other reorganization safeguards found in Chapter X (the corporate reorganization section) and Section 77 (the railroad reorganization section) of the Act. The latter section, under which progress was made toward completion of long-pending proceedings, would itself be extensively revised in the so-called Wheeler-Truman "Railroad Reorganization" Bill (S. 1869, 76th Congress, 1st Session) with an eye to further expediting sound railroad plans; the bill was passed by the Senate in May 1939, and at the turn of the year awaited further Congressional action.

In the courts the more significant developments in bankruptcy concerned themselves also with reorganizations. Thus, in *Case v. Los Angeles Lumber Products Co., Ltd.*, decided Nov. 6, 1939, a new landmark in the law, Mr. Justice Douglas expressed the decision of the United States Supreme Court that "fair and equitable" reorganization plans under the bankruptcy statutes must adhere to the historic equity doctrines of the *Boyd* case, 228 U.S. 482, and must exclude valueless interests except upon the basis of a contribution in money or money's worth reasonably equivalent to the participation accorded them. In *Taylor v. Standard Gas & Electric Co.*, 306 U.S. 307, the Supreme Court, by Mr. Justice Roberts, held that a parent corporation's claim against a wholly owned subsidiary should be allowed to participate in the latter's plan of reorganization only in subordination to the publicly held preferred stock of the subsidiary, because of the history of spoliation, mismanagement, and faithless stewardship of the affairs of the subsidiary by the parent. Again, in *Pepper v. Litton*, decided Dec. 4, 1939, Mr. Justice Douglas implemented the powers of the bankruptcy courts as an instrument in the enforcement of fiduciary standards for corporate directors and dominant stockholders, in sustaining the broad jurisdiction of such courts to examine the validity of all claims, and to set aside claims violative of such standards.

In the administrative sphere, too, the aspect of reorganization predominated, for in the year the Securities and Exchange Commission became a participant in more than a hundred corporate reorganizations under Chapter X, a function inaugurated under the amendatory Bankruptcy Act of 1938 in order to provide the courts and investors with impartial and expert advisory assistance. While the Commission's concern was primarily with the fairness and feasibility of reorganization proposals, it was in addition a salutary force in securing the compliance of parties with the law's procedural requirements, and in affording a repository of information relating to the law's operations.

In the field of bankruptcy proper the only notable development of the year was the appointment by the Attorney General of a committee to investigate the administration of the Bankruptcy Act, with Solicitor General Jackson as chairman and a membership representative of the Federal bench, Government departments, and the law schools. This committee has undertaken the study of the operation and effect of the numerous procedural and substantive innovations made in the amendatory Bankruptcy Act of 1938, with particular regard to the compensation of referees and other officers, to the lack of co-ordinated governmental supervision of bankruptcy administration and commercial frauds generally, and to the burdens on the Federal judiciary entailed in the administration of insolvent estates. (See also RAILROADS.)

(J. N. F.)

Baptist Church. The Baptists of America, totalling 10,548,673 members, are divided into two main

bodies; the first, three groups with 10,008,673 members; the second, fifteen miscellaneous groups with 540,000 members. In the first division the Southern Convention has 24,932 churches with 4,770,185 members; the National (coloured) 24,000 churches and 3,796,645 members; the Northern 7,569 churches and 1,471,788 members.

The Southern (Baptist) Convention (May 1939) concerning International Relations resolved: "In view of the present confused and disturbed International Relations we pledge ourselves anew to the spirit of peace and to the cultivation of that spirit among our people and in our relation to all other peoples."

They also declared: "Believing religious liberty to be not only an inalienable human right, but indispensable to human welfare, a Baptist must exercise himself to the utmost in the maintenance of absolute religious liberty for his Jewish neighbour, his Catholic neighbour, his Protestant neighbour, and for everybody else."

The Northern (Baptist) Convention (June 1939) passed the following resolutions: "Whereas, war is utterly contradictory to the spirit and ideals of Christianity, carries with it destruction of spiritual and moral values . . . therefore, be it

"Resolved, that we declare our emphatic opposition to the whole war system and all things related thereunto, furthermore, be it

"Resolved, that we give our support to pacific means for settling international disputes and that as fundamental to this we work for the establishment of the Kingdom of God on earth based on righteousness and justice."

One of the most significant gatherings was the meeting of the Congress of the Baptist World Alliance in Atlanta, Georgia, in July, attended by some 60,000 Baptists. Concerning peace and war the Congress, among other resolutions, adopted the following:

"It seems to us to be an important task for all the friends of peace in the world to try to keep, strengthen, and guard the League of Nations, and to work for making the League a better instrument for the fellowship and co-operation between nations than it is at present. This should be done through needed reforms in a human and Christian spirit. For this purpose it is evidently of utmost importance that, if possible, all nations become members of the League."

(R. E. E. H.)

Bar Association, American: see AMERICAN BAR ASSOCIATION.

Barbados: see WEST INDIES, BRITISH.

Barley. Average prices received by United States farmers for barley advanced from 34.5 cents a bushel August 15 to 42.8 cents a bushel Sept. 15, 1939, as a result of the outbreak of war. The barley crop in 1939 in 22 leading countries was estimated by the International Institute of Agriculture as 1,135,332,000bu., and 1,049,911,000bu. in 1938. U.S.S.R. and China are omitted. Unofficial estimates placed the Russian crop at 340,769,000bu. in 1938. Latest Chinese figures are an average annual yield of 346,212,000bu., 1933-37.

Production of Barley in Certain Countries, 1938 and 1939

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
Germany . .	194,920,000*	209,168,000†	Syria & Lebanon . .	..	17,611,000
Turkey . .	..	110,626,000	Tunisia . .	16,076,000	4,593,000
French Morocco . .	97,740,000	49,869,000	Bulgaria . .	15,332,000	10,294,000
Japan . .	74,430,000	64,182,000	Sweden . .	..	12,241,000
Poland . .	67,977,000	62,086,000	Italy . .	11,270,000	11,386,000
Spain . .	64,298,000‡	63,807,000	Lithuania .	11,243,000	12,586,000
Denmark . .	..	62,438,000	Egypt . .	10,941,000	10,686,000
France . .	..	59,286,000	Latvia . .	..	10,131,000
Chosen . .	61,072,000	51,100,000	Greece . .	10,059,000	11,276,000
Iraq . .	..	52,286,000	Finland . .	8,451,000	9,524,000
Algeria . .	50,524,000	26,067,000	Netherlands	5,971,000	6,452,000
Rumania . .	41,338,000	38,223,000	Norway . .	..	5,711,000
Hungary . .	35,841,000	33,253,000	Ireland . .	..	5,142,000
England & Wales . .	34,627,000	37,473,000	Scotland . .	..	4,573,000
Argentina . .	..	20,209,000	Belgium . .	..	4,098,000
Yugoslavia .	19,918,000	19,349,000	Estonia . .	3,674,000	4,443,000
			Luxemburg .	147,000	149,000

*Includes Austria and the Sudeten.

†Does not include Austria and the Sudeten.

‡Not included in totals.

The United States crop was 269,540,000bu. in 1939 and 252,139,000bu. in 1938, Department of Agriculture preliminary estimate. Canada, 99,209,000bu. in 1939 and 102,242,000bu. in 1938. Other production is given in the accompanying table. (S. O. R.)

Baroda, Maharaja, (GAEKWAR SIR SAYAJI RAO III)(1863-1939), Indian prince and gaekwar of Baroda, was born on March 10 of parents who were members of the less affluent branch of the State's royal family. In 1874 his predecessor, Malhar Rao, was deposed after being tried for poisoning a British resident. The widow of Malhar Rao's predecessor was asked to choose an heir from among the descendants of the original gaekwar, and her choice fell upon Sayaji Rao, then a lad of 12. He became maharaja in 1875 and was invested with full powers in 1881. An enlightened ruler, he instituted many reforms in his small state such as the forbidding of infant marriages, the readjustment of the old systems of taxation, and the building of hospitals and industrial schools. He favoured British rule in India and during the World War made gifts of approximately 3,300,000 rupees to Great Britain for war purposes. In 1881 Queen Victoria made him a Knight Grand Commander of the Star of India and in 1919 he was awarded the Grand Cross of the order of the Indian Empire. He died at Bombay on February 6.

Barton, Donald Clinton (1889-1939), American geologist, was born June 29 at Stow, Mass., and was educated at Harvard, where he received his doctorate in 1914. After two years of teaching he was employed as a field geologist for an oil company. He became one of the nation's leading geophysicists and authorities on the geology of petroleum. In 1939 he was elected president of the American Association of Petroleum Geologists. He died July 8 at Houston, Texas.

Barzilai, Salvatore (1860-1939), Italian patriot and legislator, was born at Trieste on July 5. As a young man he became associated with the Italian Irredentist movement, and in 1878 he was arrested for treason at Trieste for plotting the conquest of the Trentino while Austrian troops were engaged in the occupation of Bosnia and Hercegovina. After a year in prison he was acquitted and went to Italy, where he studied law and became editor of the *Rome Tribuna* (1883-1893). He was president of the Italian Press association from 1902 to 1915 and from 1920 to 1922. The formation of the Triple Alliance in 1882 did not discourage Barzilai's tenacity in opposing Austria and agitating for "return" of the Trentino. After Italy declared war against Austria and was awarded the "irredeemed" Austrian territory by the treaty of Versailles, Barzilai's popularity in Rome scarcely knew bounds. He served as minister without portfolio in the second cabinet of Premier Salandra, was a delegate to the Peace Conference in 1919, and senator from Dec. 4, 1920 until his death at Rome on May 1. He was the author of several volumes on criminology and penology.

Basalt: see STONE.

Baseball. The year in which baseball observed its centennial was notable chiefly for the unquestioned domination of the New York Yankees under the leadership of their manager, Joseph Vincent McCarthy. Colonel Jacob Ruppert, who built this baseball empire and, as owner and president, guided it many years, died early in the year. Lou Gehrig, last of the old guard, the "Murderers' Row" of another generation, withdrew from the picture involuntarily, stricken with a form of paralysis, on May 2 after rounding out a matchless record of 2,130 consecutive games in his major league career spanning 15 years.

They won their fourth straight American League pennant and their fourth straight world series. They smashed the Cincinnati Reds, winners of the National League pennant, in four straight games to achieve their world series triumph. They had the leading batter in Joe DiMaggio, the game's greatest player. They had

six of their pitchers among the leading ten in the American League's final official averages. They had the most effective defensive club in either league. In short, the Yankees had things all their own way, even down to the outcome of the annual All-Star game in mid-season when the American Leaguers, Yankees, naturally, predominant in the lineup, trounced the National Leaguers. Only in patronage was the National League in the ascendant. The older circuit attracted close to 6,000,000 to its championship games. The attendance for the eight American League cities approached 5,000,000. Night baseball, introduced to the major leagues by Cincinnati and Brooklyn in past years, spread to the American League where Cleveland, Chicago, and Philadelphia played under artificial light. The Yankees gave the movement impetus by agreeing to play night games away from home, although the club steadfastly scorned introducing night baseball in the huge Stadium in New York city. Radio broadcasts of games were conducted in both the Yankees' and the Giants' home parks for the first time.

The Yankees created a record when they became the only club in major league history to win four straight world series championships. They won the first game, 2-1, as a crowd of 58,541 occupied the Yankee Stadium. Charley (Red) Ruffing, pitching hero of the opening game of the 1938 series, conquered Paul Derringer of the Cincinnati Reds in a struggle of right-handed pitching aces. A three-base hit for the Yankees' rookie star, Charles Keller, when Ival Goodman, Cincinnati right-fielder, misjudged his fly, was followed by William Dickey's single to clinch the game for the Yankees with one out in the ninth inning. In the second game Monte Pearson's 2-hit pitching and Ellsworth (Babe) Dahlgren's first world series home run were highlights in a Yankee victory, 4-0, at the expense of Bucky Walters.

A crowd of 59,791, largest for the series, saw the game in the Yankee Stadium. Two home runs by Keller, others by DiMaggio and Dickey, gave the Yankees victory, 7-3, in the third game, played in Cincinnati before 32,723 persons. The fourth and final game, played in Cincinnati, saw the Reds go completely to pieces, three errors committed in the tenth inning letting in three runs which gave the Yankees the game and the series, 7-4, before 32,794 fans.

Because of the modest accommodations in Cincinnati's Crosley Field, crowds and receipts were not as large as in some other years. The players' pool likewise fell off. A total of 183,849 persons saw the four series games. The aggregate receipts amounted to \$745,329.09. The players' pool amounted to \$380,117.84, which compares to \$434,094.66 for the four-game series in which the Yankees beat the Chicago Cubs in 1938.

In the championship season the Yankees became the only club in American League history ever to win eleven pennants. They gave to Manager McCarthy the distinction of his fifth pennant as club pilot. They were hailed generally as baseball's all-time super-team. They clinched the pennant early in September and finished the season 17 games ahead of the Boston Red Sox, after an uncertain early-season start. In third place were the Cleveland Indians. Then came Chicago, Detroit, Washington, Philadelphia, and St. Louis. In contrast, was the exciting finish for the pennant in the National League. The Cincinnati victory was not assured until the season entered its final week. Then the athletes under William McKechnie, known to intimates as "The Deacon," gave Cincinnati its first baseball pennant in 20 years, or since the dark days of 1919 leading to what developed into the notorious Black Sox world series scandal that shook baseball to its foundations. Cincinnati repulsed the threat of St. Louis and finished the season 4½ games ahead of St. Louis. The other clubs in the National League finished in this order: Brooklyn, Chicago, New York, Pittsburgh, Boston, Philadelphia. The Philadelphia clubs in each



BILL WERBER OF THE CINCINNATI REDS lines out the second and last hit off Monte Pearson, New York Yankee pitcher, in the ninth inning of the second World Series game Oct. 5, 1939. The Yankees won the series in four straight games

league finished more than 50 games behind the leaders. St. Louis finished 64½ games behind the Yankees.

Comparative Statistics.—The American League supremacy extended to the All-Star game. In the seventh renewal of this game played in the Yankee Stadium, New York, a composite team of American League players defeated a composite National League team by a score of 3 to 1. The game was witnessed by 62,892 persons, and attracted receipts of \$75,701. It was the fifth American League triumph in the seven games played. Through the season the American League maintained its hitting supremacy, particularly in the matter of home runs. American League batters accounted for 796 home runs while the National League sluggers hit 649. The individual leaders in home runs were Jimmy Foxx of the Boston Red Sox with 35 and Johnny Mize of the St. Louis Cardinals with 28. The Yankees contributed 166 to the American League total, leading the league. The New York Giants led the National League with 116.



LIVING MEMBERS of baseball's hall of fame at the centennial celebration in Cooperstown, N. Y., June 12, 1939. In the front row, left to right, are Eddie Collins, Babe Ruth, Connie Mack, Cy Young; in the rear row, Hans Wagner, Grover Alexander, Tris Speaker, Napoleon Lajole, George Sisler, Walter Johnson

The best all-around batting average for the season was made by an American League player, DiMaggio. He finished with a percentage of .381. In the National League, Mize was the batting leader. His percentage was .349. At the finish their standings were as follows:

	Games	At Bat	Runs	Hits	Percentage
DiMaggio	120	462	108	176	.381
Mize	153	564	104	197	.349

Robert Moses (Lefty) Grove of the Boston Red Sox, 39-yr.-old veteran of 15 major league campaigns, had the finest pitching record in the American League. For the ninth time he led the league in earned run average—2.54. For the seventh time his earned run average was under 3.00 per nine-inning game. He ended the 1939 campaign with a lifetime mark of 285 complete games and 286 triumphs, the highest number of victories for any pitcher still active in the major leagues. In the National League, William H. (Bucky) Walters, of the Cincinnati Reds, was the leader on an earned run basis which is the determining factor. He had an earned run average of 2.29, a better showing than that of Paul Derringer, a clubmate, whose average was 2.930, although Derringer's performance in winning 25 games and losing 7 in 38 appearances gave the latter a games won and lost percentage of .781, the highest average on this basis. The comparative standings for the season for Grove and Walters, in games pitched, games credited as won, and games charged as lost follows:

	Games	Won	Lost	Percentage
Grove	23	15	4	.789
Walters	39	27	11	.711

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Bauxite. An increasing demand for aluminium has stimulated the production of bauxite in a number of countries that were formerly only minor producers, particularly Yugoslavia, Hungary, Italy, Netherlands East Indies, Greece, and the Soviet Union, but has not yet materially affected the output of the other large producers; the increased output of the last two is largely for

home consumption, but that of the first four goes largely to Germany.

On the average, about 60% of the output is used for metal, while

World Production of Bauxite
(Metric tons)

	1929	1932	1936	1937	1938
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France	666,348	401,430	648,500	688,200	682,400
Greece	129,000	137,400	150,000?
Hungary . . .	389,152	111,558	329,091	451,576	540,700
Italy	192,774	86,553	262,246	334,000	383,000
Neth. E. Indies	..	..	133,700	199,000	300,000?
Surinam . . .	219,603	126,513	234,845	329,329	371,600
U.S.S.R. . . .	..	37,400	203,200	250,000?	200,000?
United States .	371,648	97,895	377,976	426,977	317,000
Yugoslavia . .	103,366	67,086	292,174	354,233	396,400
World Total	2,185,000	1,017,000	2,835,000	3,725,000	3,810,000

the remainder goes into chemicals, abrasives, cement, and refractories. (G. A. Ro.)

Beans, Dry. Commodities having a spectacular advance in retail prices in Sept. 1939, because of the outbreak of war, were described by the U.S. Department of Agriculture as navy beans, sugar, lard, and fresh pork. Dry beans advanced from \$2.63 per 100lb. August 15 to \$3.80 September 15. The U.S. crop of dry beans in 1939 was estimated at 13,575,000 bags of 100lb. each, compared to 15,268,000 bags in 1938 and a ten-year average (1928-37) of 12,638,000 bags.

Dry Bean Production by States, 1938 and 1939
(in 100 lb. bags)

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Michigan . . .	4,205,000	4,567,000	Nebraska . . .	134,000	190,000
California . .	4,000,000	4,563,000	Maine	96,000	101,000
Idaho	1,387,000	1,566,000	Arizona	35,000	64,000
Colorado . . .	1,240,000	1,498,000	Vermont	19,000	19,000
New York . . .	1,131,000	1,449,000	Minnesota . . .	14,000	14,000
New Mexico . .	643,000	531,000	Oregon	14,000	12,000
Wyoming . . .	448,000	470,000	Wisconsin	5,000	8,000
Montana . . .	202,000	216,000	Kansas	2,000	..

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headed a military mission to Rumania. After the war he was a military attaché in Paris, and after the *coup d'état* of May 1926 he was appointed Pilsudski's chief of the secretariat. When the latter became prime minister in 1930, Beck was nominated vice-premier and later in the year he became under-secretary for foreign affairs. On Nov. 2, 1932 he was named minister of foreign affairs; with Smigly-Rydz and Moscicki (*qq.v.*) he was Pilsudski's political heir after the marshal's death in 1935. His ministry of foreign affairs was marked by nimble efforts to avoid foreign entanglements and keep his country free from aggression; he also terminated the 18-year dispute with Lithuania in Aug. 1938. When Germany began to menace Danzig and the Corridor, however, he quickly signed a military understanding, and later a full military treaty (Aug. 25, 1939) with Great Britain. As Poland crumbled under German arms, Beck crossed the Rumanian border September 18 and arrived at Cernauti. With other Polish cabinet members he was interned by the Rumanian Government, first at Craiova then at Brasov, where he became seriously ill.

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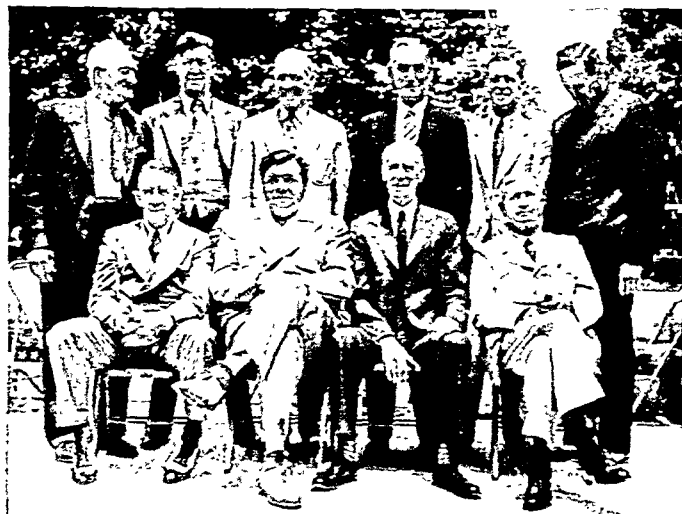
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Belgian Colonial Empire. The table below gives essential material relative to Belgium and the colonial and mandated territories administered by her. Total area 960,000 sq.mi.; total population (est. Dec. 31, 1937), 22,298,000.

History.—M. Ryckmans, the present governor-general of the

Belgian Colonial Empire

Country and Area sq. miles (approx.)	Population est. Dec. 31, 1937 ('000's omitted)	Capital, Status, Governors, Premiers, etc.	Principal Products exported 1938 (in metric tons)	Imports and Exports 1938 (in thousand francs)	Road, Rail and Shipping 1939	Revenue and Expenditure (estimate 1939) (in thousand francs)
BELGIUM, 11,775	8,361	Brussels, kingdom. King: Leopold III. Premier: M. Hubert Pierlot	wheat (total) 547,874 coal (total) 29,575,000	imp. 23,166,507 exp. 21,723,953	rds. main, 657 mi.; rly. 3,190 mi.; shpg. cleared (monthly av.) 2,502,000 net tons.	rev. 11,488,700 exp. 11,583,100
AFRICA BELGIAN CONGO, 927,000	10,217	Léopoldville, colony, Governor-General: M. Pierre Ryckmans	copper 160,271 gold 13,505 kg.	imp. 1,022,637 exp. 1,897,154	rds. main, 3,206 mi.; other 39,718 mi.; rly. (1938) 3,048 mi.; shpg. cleared 132,673 net tons.	rev. 675,453 exp. 730,380
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LIVING MEMBERS of baseball's hall of fame at the centennial celebration in Cooperstown, N. Y., June 12, 1939. In the front row, left to right, are Eddie Collins, Babe Ruth, Connie Mack, Cy Young; in the rear row, Hans Wagner, Grover Alexander, Tris Speaker, Napoleon Lajoie, George Sisler, Walter Johnson

The best all-around batting average for the season was made by an American League player, DiMaggio. He finished with a percentage of .381. In the National League, Mize was the batting leader. His percentage was .349. At the finish their standings were as follows:

	Games	At Bat	Runs	Hits	Percentage
DiMaggio	120	462	108	176	.381
Mize	153	564	104	197	.349

Robert Moses (Lefty) Grove of the Boston Red Sox, 39-yr.-old veteran of 15 major league campaigns, had the finest pitching record in the American League. For the ninth time he led the league in earned run average—2.54. For the seventh time his earned run average was under 3.00 per nine-inning game. He ended the 1939 campaign with a lifetime mark of 285 complete games and 286 triumphs, the highest number of victories for any pitcher still active in the major leagues. In the National League, William H. (Bucky) Walters, of the Cincinnati Reds, was the leader on an earned run basis which is the determining factor. He had an earned run average of 2.29, a better showing than that of Paul Derringer, a clubmate, whose average was 2.930, although Derringer's performance in winning 25 games and losing 7 in 38 appearances gave the latter a games won and lost percentage of .781, the highest average on this basis. The comparative standings for the season for Grove and Walters, in games pitched, games credited as won, and games charged as lost follows:

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Belgian Congo, has his capital at Léopoldville. Policy and the budget of the Colony are subject to a "Conseil Colonial" at Brussels and there is a permanent commission for the protection of natives. A progressive native policy is combined with an economic policy involving close co-operation of the Government with large industrial and agricultural concerns which undertake extensive social work among their native employees. Education is in the hands of "Missions Nationales," mostly Roman Catholic. The missions now claim about 3,000,000 adherents. Health work is also carried out by private organizations as well as Government.

The debt is some 220,000,000 francs. Budgetary deficits are balanced by means of a colonial lottery. During 1939 military expenditure increased, but an expansion of revenue is expected as the colony is a valuable source of war raw materials. The copper production of the Katanga was estimated to reach 114,000 tons in 1939. The production of gold increases year by year.

The central position of the territory adds importance to the expanding system of communications—rail, road, and airways. An air service linking the colony to Europe continues to function during the war, but the inauguration of air lines to Kivu has been postponed. The formation of a second "Parc National" of over 1,000,000 hectares in the Katanga has been authorized. The mandated territory of Ruanda Urundi is part of the colony but has a separate vice-governor with his capital at Astrida. It is important as a source of labour for the Katanga mines. (J. L. K.)

Belgian Congo: see BELGIAN COLONIAL EMPIRE.

Belgium. Area 11,775 sq.mi.; pop. (est. Dec. 31, 1938) 8,386,553; chief towns (pop. Dec. 31, 1938): Brussels and suburbs (cap., 1,004,452), Antwerp (273,317), Ghent (162,858), Liège (162,229). Ruler: King Leopold III; prime minister: Hubert Pierlot; languages: French and Flemish.

History.—A year that was to be a trial for Belgium began with a prolonged ministerial crisis. The issue was the old Flemish-Wallon dispute. The newest Government concession to the Flemings had been the establishment of a Royal Flemish Academy. To this had been appointed as an original member Dr. Maertens, a Fleming who had co-operated with the German invaders in the great war, been sentenced to death in his absence and later been amnestied. His history was disinterred: the ex-servicemen became the spearhead of a popular attack on the appointment and M. Spaak, the Socialist premier of the Coalition Government, was assaulted in the street. When the Liberal ministers came out in favour of the protest the cabinet fell, on February 9.

M. Pierlot, a Catholic senator, succeeded after a fortnight in forming a new coalition, with extra-parliamentary ministers for finance and other departments. Within five days this was defeated over its attempt to enforce cuts in Government expenditure, and early in March M. Pierlot obtained a dissolution.

Simultaneously King Leopold addressed a letter to the premier declaring that the country had been brought to its present pass by the partisan bitterness of politics; that the head of the State was sometimes forced to sanction decisions taken independently of him and that the electors should think of the higher interests of national unity.

The elections resulted in gains for the Catholics (who once more became the biggest party in the chamber) and the Liberals, and losses for the Socialists; but the big sensation was the defeat of the Fascist Rexists, whose representation in the Lower House dropped from 21 to 4.

Immediately after the declaration Dr. Maertens, the occasion of all the trouble, resigned. But the Socialists refused to participate in a new coalition, and a Catholic-Liberal Government was formed, which was soon given special powers to legislate on de-

fence and finance matters.

Belgium had called up reservists in the spring crisis: she called them up again in the autumn. But she also took active steps to avert hostilities.

At the end of August representatives of the Oslo Group of Powers were invited to Brussels to consider the position, and King Leopold broadcast a peace appeal in their name. A few days after, with Queen Wilhelmina of the Netherlands, he offered his mediation, proposing a five-Power conference of Britain, France, Germany, Italy, and Poland. But he made it quite plain, in a later broadcast, in October, that Belgium, though neutral, would fight if she were attacked.

That she might have to fight seemed more than possible in November, when reports spread of German troop concentrations on the Belgian-Dutch frontier. Belgium once more tightened up her frontier defences, for the threat was taken very seriously, and the population were warned how to act if air raids occurred. King Leopold paid a hasty visit to the Hague and made another joint appeal with Queen Wilhelmina. It was later reported that a German invasion of Holland would in fact have taken place on November 11 had not Belgium made it plain that she could not remain indifferent in that event. The peace offer, however, was rejected by the Germans, on the grounds that the statements of terms with which Britain and France had replied to it in themselves already constituted rejections.

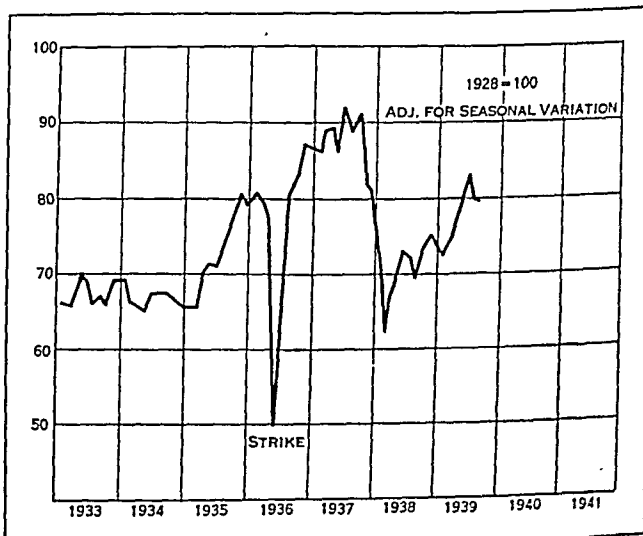
There was one more Belgian-Dutch piece of collaboration in the year: over a protest against the Anglo-French export blockade of Germany. And though 1939 passed out amid a new cabinet crisis, M. Pierlot solved it, within the first week of January, by forming a new, and smaller cabinet of "National Union"—this time with Socialist collaboration. (R. Ms.)

Education 1937.—Primary schools 8,657; scholars 960,191; higher schools 293; scholars 83,093; universities (1937-38) 4; students 10,776.

Defence 1939.—Army (inc. air force): 4,671 officers, 85,500 other ranks; mainly compulsory service (longest terms 17 months).

Banking and Finance.—Revenue, ordinary (est. 1939) 11,488,700,000 francs; expenditure, ordinary (est. 1939) 11,583,100,000 francs; public debt (Jan. 1, 1939) 57,334,571,000 francs; notes in circulation (Aug. 31, 1939) 26,496,000,000 francs; gold reserve (Aug. 31, 1939) 18,112,000,000 francs; exchange rate (average 1938) 28.93 belgas = £1 sterling; 5 francs paper = 1 belga.

Trade and Communication.—External trade (merchandise):



BELGIUM: Industrial production index (*The Annalist*)

imports (1938) 23,166,507,000 francs; (Jan.-June 1939) 11,303,000,000 francs; exports (1938) 21,723,953,000 francs; (Jan.-June 1939) 11,222,000,000 francs. Communications and transport: roads, suitable for motor traffic (1939) 6,571 mi.; railways, open to traffic, main (1939) 3,190 mi.; airways (1938), distance travelled 1,457,050 mi.; passenger mileage 8,255,980 mi.; baggage mileage 156,762 ton mi.; mail mileage 78,412 ton mi.; newspapers 52,504 ton miles. Shipping (June 30, 1938) 430,600 gross tons; tonnage launched (July 1938-June 1939) 27,600 gross tons; vessels entered, in net tons, (monthly average 1938) 2,497,000; (July 1939) 2,801,000; cleared (monthly average 1938) 2,502,000; (July 1939) 2,803,000; motor vehicles licensed (Dec. 31, 1938): 155,174 cars; 77,600 commercial; 67,016 cycles; wireless receiving set licences (1938) 1,082,200; telephone subscribers, local (1938) 287,323.

Agriculture, Manufactures, Mineral Production.—Production 1938 (in metric tons): wheat (1939) 547,874; oats (1939) 621,062; rye (1939) 385,033; potatoes 3,258,433; coal 29,575,500; pig iron and ferro-alloys 2,464,800; steel 2,212,000; beet-sugar 1,201,631; barley (1939) 89,230; butter 64,150; margarine 59,331; artificial silk 5,800. Industry and labour: industrial production (1929=100) (average 1938) 79.9; (June 1939) 80.7; number wholly unemployed (average 1938) 131,909; (June 1939) 150,921; partly (average 1938) 160,571; (June 1939) 151,540. (W. H. WN.)

Benefactions: see DONATIONS AND BEQUESTS.

Benes, Eduard: see BOHEMIA AND MORAVIA.

Benson, Sir Frank (1858-1939), British actor, was born November 4 at Alresford, Hampshire, England, and died December 31 at London. For a biography, see *Encyclopædia Britannica*, vol. 3, p. 416.

Berlin-Rome Axis: see EUROPEAN WAR; GERMANY; ITALY; STRATEGY OF THE EUROPEAN WAR.

Bermuda, a British insular colony 580 miles east of Cape Hatteras, teras; language, English; capital, Hamilton (pop. 1,863). The area is 19½ square miles. The population by the 1939 census was 30,516 (not including 4,907 members of the military and naval forces and tourists), of whom Negroes constitute 63%. The colony has an appointed governor and council and an elected assembly.

In April, Governor Sir R. J. T. Hilyard resigned after a disagreement with the assembly over the latter's refusal to exempt him from the Bermudan law forbidding use of passenger motor cars. He was succeeded by Major General Sir Denis K. Bernard.

The threat of war involving the mother country resulted in increased war preparation throughout the year. A war service census was taken in March; gas defence drills were instituted, and other steps taken. At the outbreak of war in September, a state of national emergency was declared, giving the governor the power to rule by decree. Censorship of the mails was established, and conscription for defence put into effect.

The assembly passed a Trading With the Enemy Act, laying down penalties for trading with the enemy and making provisions concerning enemy property and subjects, as well as other legislation enabling the colony to receive and deal with prize ships which might be brought in. The law proscribing motor cars was likewise repealed.

Regular steamship communication between Bermuda and New York and European ports, normally maintained by British vessels, was seriously disrupted by the war, but service by the United States merchant marine developed with the passage in the United States of the Neutrality Act, which exempted Bermuda from its

restrictions. Early in 1939 Clipper service between the United States and Europe was established, with Bermuda a stopping point, supplementing the already existing New York-Bermuda air service. Early in the year the latter service was marred by the mid-ocean crash of the Imperial Airways flying boat "Cavalier" with the loss of three lives (January 16).

The tourist trade, principal industry of the colony, normally provides an estimated 85% of the revenue. During 1938, 82,062 tourists (95% of them from the United States) visited Bermuda. Outbreak of war in Europe in Sept. 1939, however, precipitated a serious decline. Optimism, based on hopes that Bermuda, unaffected by the war, would attract many of the tourists discouraged from European travel, was not borne out.

In 1938, imports, chiefly foodstuffs, textiles, and manufactured goods, totalling £1,906,688 (from the United States, 43.9%; Great Britain, 29.4%; Canada, 14.6%); exports (including re-exports) were £145,943, 13% less than in 1937, but Bermuda products, chiefly vegetables, flowers, and bulbs, increased 58%, to £452,072. Customs duties comprise 75% of the revenues. Great Britain's reciprocity treaty with the United States (effective in Jan. 1939) resulted in a revenue decline and necessitated curtailment of expenditures. Bermuda has 30 Government-aided private schools (4,907 enrolment in 1937).

(L. W. BE.)

Bernstorff, Johann Heinrich, Count von

(1862-1939), German Count and diplomat, was born November 14 at London, where his father was then ambassador to Great Britain. The younger Bernstorff was later to become councillor to the London embassy, and he served also in Belgrade, St. Petersburg, and Cairo. In 1908 he was appointed ambassador to the United States. After the outbreak of the World War, when Bernstorff was still in Washington, he repeatedly warned Berlin that its espionage in America and its unrestricted submarine warfare would lead to a declaration of war by the United States. He was handed his passport Feb. 3, 1917. After his return to Germany he became ambassador to Turkey for three years, and from 1921 to 1928 he was a member of the Reichstag. After Hitler came into power von Bernstorff went into voluntary exile in Geneva, Switzerland, where he died October 6. He was author of *My Three Years in America* (1920) and *Memoirs of Count Bernstorff*.

Best Sellers: see PUBLISHING: *Best Sellers*.

Bicycling: see CYCLING.

Bigelow Pension Plan: see ELECTIONS.

Billiards. Billiards in the United States suffered by the lack of major competition throughout 1939. Only one championship, with the professional three-cushion leadership of the world at stake, was determined and following four months of home-and-home matches Joe Chamaco of Sonora, Mexico, emerged the new titleholder. Ten experts, each representing an American city, were in the field and Chamaco, playing for New York city, finished first by the margin of seven games. He won 55 and lost 17 for a percentage of .762. Second place went to Jay Bozeman of Chicago with a mark of .667, while another Chicagoan, Allan Hall, wound up third with .583. Chamaco, succeeding Roger Conti of France to the championship, also accounted for the best performances in the competition. He achieved the highest run, 18, and the best game or shortest number of innings for a single match, 23. Conti, Willie Hoppe of New York, Welker Cochran and Jake Schaefer both of San Francisco, and Kinrey Matsuyama of Japan did not compete. Those who rounded out the field were John Layton of Hartford, Conn., Frank Scoville, Buffalo, N. Y.; Otto Reiselt, Philadelphia; Charles Jackson, Detroit, Mich.; Tiff

Denton, Kansas City, Mo.; Arthur Thurnblad, Kenosha, Wis., and Charles McCourt, Cleveland, Ohio.

There were no balk-line or pocket billiards championship tournaments in 1939, so that existing titleholders retained their leaderships. Cochran at 18-2, Hoppe at 18-1 and 71-2, Schaefer at 28-2 and Jimmy Caras of Wilmington, Del., at pockets continued to rule the professionals. The same held true in amateur circles where, for the absence of competition, all crown-holders remained on top.

(L. Ef.)

Billings, Warren K.: see CALIFORNIA.

Biochemistry. Polysaccharides.—Polysaccharides are made up of numerous simple carbohydrate units. Among the most widely distributed and best studied are starches, glycogens, dextrines, and celluloses.

All of these are polymers of glucose and yet they have different physical and chemical properties. Hence these differences must be due to differences in complexity and structure of these giant molecules.

Lignins are also large molecules which are polymers of small units. The lignins are the non-cellulose constituents of wood. They are distinguished from the celluloses by their greater resistance to solution by strong acids and by the difference in the character of the units.

Proteins.—X-ray analysis, more accurate chemical analyses, studies on protein surface films, and other physical measurements all confirm the view that protein molecules are very large polymers of numerous amino acid units united by peptide linkings.

It is of particular interest to note that the earlier chemical analysis of proteins in terms of amino acid units supports the concept that protein molecules are made up of larger units and that these larger units are in general made up of 288 amino acid molecules occurring in definite frequencies and orders. This is also in part confirmatory of the cyclol theory.

Enzymes and Vitamins.—Enzymes have always been considered and found to be catalytic reagents which have the remarkable property of speeding up certain chemical reactions in a very specific manner at body temperatures. Inasmuch as vitamins also produce profound effects in exceedingly small quantities it is suspected that they might also act as catalytic agents. This has now been established for at least three of the vitamins. When these vitamins are combined with pyrophosphoric acid or with one or more nucleotide groups and/or with specific proteins they yield very specific enzymes of great importance in oxidation-reduction processes in living systems. Thus thiamin, or vitamin B₁ as it is commonly called, when combined with pyrophosphoric acid, yields the enzyme cocarboxylase which is necessary in the removal of carbon dioxide from certain acids by the enzyme carboxylase. This thiamin pyrophosphate is the same as the cocarboxylase obtained from natural sources.

The presence of this form of vitamin in nerve tissue is essential to prevent the accumulation of pyruvic acid and the destruction of nerve fibres as a result of which the symptoms of beri-beri develop.

Riboflavin or vitamin B₂, when combined with pyrophosphoric acid and protein constitutes the "yellow enzyme" which carries out one step in the transfer of hydrogen from certain food stuffs or intermediate products of metabolism to be finally oxidized to water by other enzymes. Nicotinic acid or its amide or the anti-pellagra vitamin, when combined with protein and pyrophosphoric acid, constitutes coenzymes 1 and 2 which are essential for the action of certain dehydrogenases in some of the many transfers of hydrogen from molecule to molecule until finally oxidized to water. It is very probable that other vitamins will also be

found to be catalytic agents and hence should be included under enzymes.

Some of the other vitamins which had been known only by their physiologic effects in preventing certain specific pathologic changes, but which had not been obtained in pure form have now been purified and in part synthesized. Adermin, the rat anti-dermatitis factor, B₆, has been synthesized. It is 2-methyl-3-hydroxy-4,5-bis (hydroxy-methyl) pyridine. Pantothenic acid, long recognized as a widely distributed yeast-growth stimulant, has been found to be the chick antidermatitis factor. Vitamin K, the anti-haemorrhagic factor, has been found to be a naphthoquinone derivative. A synthetic form, 2-methyl-1,4-naphthoquinone, is very effective in preventing haemorrhage in chicks kept on a deficient diet.

Metabolism.—In the field of carbohydrate metabolism the importance of the interrelations between pituitary, pancreas, and adrenals is appreciated more than ever and we are no doubt on the verge of some very important discoveries which may have a profound bearing on the treatment of diabetes mellitus. The discovery that liver tissue contains an enzyme other than amylase which synthesizes glycogen from glucose or levulose and phosphate is a new milestone in our progress in this field.

The use of labelled atoms in metabolism studies has been very productive in confirming older views and in introducing new aspects. Space permits reference to only two aspects. It has been shown that six hours after radioactive phosphorus in the form of inorganic salts is fed to chickens we find radioactive phosphorus very widely distributed in the tissues. The highest concentration of this active phosphorus is found in the liver, kidney, and heart, some in the bones and muscle, and least in the brain. This indicates the extent to which there is an exchange of phosphorus between tissues and blood and thus indicates which tissues are most active. It is surprising to find bone more active than brain tissue.

Equally interesting is the observation that tumour tissue appears to be of the same order of phosphorus metabolism activity as liver and kidney.

The studies with heavy nitrogen have shown that tissue proteins are in constant chemical change; that is, they are continually being partially hydrolyzed, deaminized, and reaminized. The extent to which reaminization takes place in mammalian tissues was particularly surprising.

This new method of study has also confirmed earlier conclusions as to the ability of the albino rat to synthesize certain amino acids and its inability to synthesize others. (See also PHYSIOLOGY.)

BIBLIOGRAPHY.—*Annual Review of Biochemistry* (1939); *Cold Spring Harbor Symposia on Quantitative Biology* (1938) contains articles on proteins; *Endocrinology* (1940) contains four papers on carbohydrate metabolism presented at a symposium sponsored by the American Physiological Society at Toronto, April 20, 1939; Current biochemical journals. (F. C. K.)

Biography: see AMERICAN LITERATURE; ENGLISH LITERATURE; CHILDREN'S BOOKS; MOTION PICTURES.

Biological Survey, U. S. Bureau of, the Federal wild life service, became a part of the United States Department of the Interior on July 1, 1939, in accordance with President Roosevelt's Reorganization Order No. 2. Established to study relations of birds to agriculture in 1885 in the Department of Agriculture, where it grew from sectional to bureau status, this agency is now in the Federal Department that more than any other is concerned with the conservation of natural resources. Under Dr. Ira N. Gabrielson, Chief, the bureau includes divisions of wild life research, Federal aid in wild life restoration, land acquisition, wild life refuges.

construction and Civilian Conservation Corps operations, game management, and predator and rodent control.

Outstanding in the bureau's work in 1939 was the success in initiating a Federal program to aid States in restoring wild life, by paying 75% of the cost of approved projects. This program, authorized by Congress in 1937, went into effect on July 1, 1938, with an appropriation of \$1,000,000. By the end of the first year 43 States had become eligible for participation and 37 had submitted a total of 87 projects—30 involving research; 28, development of natural conditions; 28, acquisition of lands; and 1, a combination of research and development. An increased appropriation of \$1,500,000 became available on July 1, 1939.

There were 51 new refuges added to the Federal system in 1939 and acreage increases in 25 others, bringing the total to 266 with 13,620,128 acres, including 16 with 4,094,200 acres in Alaska, Hawaii, and Puerto Rico. On December 31 there were 144 Federal refuges for waterfowl, 63 for other migratory birds, 18 for wild life in general, 29 for nongame birds chiefly, and 12 for big-game species. For the fourth consecutive year the bureau's mid-winter waterfowl inventory, in Jan. 1939, showed a steady increase, and investigators found encouraging conditions on the breeding grounds during the summer. Federal regulations governing migratory-bird hunting remained much the same as in 1938. Reports from the sale of Federal stamps required of all waterfowl hunters over 16 showed that 1,002,715 were purchased in 1938, as compared with 783,039 in 1937, 603,623 in 1936, 448,204 in 1935, and 605,001 in 1934, first year of the stamp sales.

On June 3, 1939, a national wild life research refuge on the Patuxent river, within a short distance of the national capital, was dedicated—the first national wild life experiment station of a general nature. (See also BIRD REFUGES; WILD LIFE CONSERVATION.)

Publications in 1939 included the following, in series of the Department of Agriculture: Technical Bulletins 634 and 643, *Food of game ducks in the United States and Canada* and *Food habits of North American diving ducks*, and Circulars 504, 520, and 529, *Early winter food of ruffed grouse in the George Washington National Forest*, *Wildlife of the Atlantic coast salt marshes*, and *Food habits of prairie dogs*. (H. Z.)

Biology: see BOTANY; MARINE BIOLOGY; ZOOLOGY.

Bird Refuges. There are (Jan. 1, 1940) 250 refuges for all forms of wild life, administered by the Biological Survey, in the United States, covering 9,525,926 acres. Of these 239 (4,073,430ac.) are primarily for birds and 11 (5,452,496ac.) are primarily for big-game animals, but accord incidental protection to birds.

As in previous years development work during 1939 was continued through the medium of CCC, WPA, and NYA labour. The rehabilitation of land and water areas for birds has included such measures as the stabilization of water levels, the planting of aquatic plants and food-bearing shrubs and trees, and the construction of nesting islands and upland game bird shelters. Reports from refuges from coast to coast indicated increased breeding or larger concentrations of waterfowl during migration than for many years.

Three additional bird refuges were acquired by easement in furtherance of the program begun in North Dakota in 1935, under which land owners give to the Federal Government perpetual use of their land for wild life conservation purposes. This program now provides for 84 refuges in five States, totalling 145,064 acres. The refuges of this type are small. However, owing to location in the middle western prairie States, which have always contained the most favoured breeding grounds for many kinds of waterfowl in the United States, they are proving very valuable in supplementing the large nesting refuges in these States.

Several areas, purchased by the Resettlement Administration in connection with its submarginal land-retirement program and transferred to the Biological Survey for administration, were made

Federal wild life refuges by Executive order during the year. Among these was the Piedmont Wild Life Refuge, in Jones and Jasper counties, Georgia, embracing 58,400 acres. It provides sanctuary for wild turkeys, of which larger breeding stocks are urgently needed, and bob-white quails. The Carolina Sandhills Wild Life Refuge, in Chesterfield county, South Carolina, containing 50,000ac., will afford protection to wild turkeys, bob-white quails, and other wild life in that State. Another important acquisition was the Necedah Migratory Waterfowl Refuge, containing 40,500ac., in Juneau county, Wisconsin. (See also BIOLOGICAL SURVEY, U. S. BUREAU OF; WILD LIFE CONSERVATION.)

(E. A. G.)

Birth Control. Constant pressure for higher birth rates continued in Germany, Italy, France, and England during 1939. New types of decoration are now bestowed officially on mothers of large families in Germany, and Italy rewards its fertile mothers with medals. Tax exemptions, family grants and other privileges are accorded fathers of large families in both Germany and Italy; bachelors pay higher taxes than married men and all discussion of birth control is taboo. Many population experts believe, however, that the population problem, including its many aspects of differential growth, distribution in relation to natural resources, etc., must have serious consideration if lasting peace is to be achieved following the war now in progress.

England.—The National Birth Control Association at a general meeting in May 1939, officially changed its name to the Family Planning Association, which its Board believes "describes more accurately our functions and the increasing scope of our activities." Lord Horder continues to head the Association. A new chemical contraceptive, the result of research under the Medical Sub-Committee, was announced in January. The British Ministry of Health's Interdepartmental Committee's Report on Abortion was issued in June. It stated that "available facilities for giving contraceptive advice" to women when further pregnancy means danger to life or health "are seriously inadequate to satisfy the need" and urged that this matter be brought forcibly to the attention of local authorities, both as a health measure and as a partial solution of the problem of abortion.

Canada.—The Parents' Information Bureau of Kitchener, Ontario announced that up to 1939 it had advised 100,000 Canadian mothers on contraception, and that 18,000 were advised during 1938.

Bermuda.—Government grants in support of birth control clinics were continued during 1939.

Egypt.—The Egyptian Birth Control Association was organized in Cairo early in 1939.

India.—Work continues under the Family Planning Association; new clinical services continue to be established.

Jamaica.—The Jamaica Birth Control League was formed in March 1939, with Dr. Charles Levy as president and Dr. W. E. McCulloch (Hon. secretary, Jamaica Medical Ass'n) as chairman. Contraceptive service is now available in a number of towns on the island and under the Government Medical Department in one parish.

Scotland.—The Scottish Advisory Committee of the Family Planning Association sent a delegation in June to the Parliamentary under-secretary of State, the secretary of health and the chief medical officer, urging extension of contraceptive advice, under local authorities, as a health measure and as aid in reducing the incidence of induced abortion.

South Africa.—The Department of Health addressed a circular letter to local authorities recommending the establishment of mothers' clinics, service to include contraceptive advice and instruction to married women, in cases where pregnancy would be

detrimental to health. The department is strongly in favour of such service and is providing a grant-in-aid to the South Africa National Council for Maternal and Family Welfare, which has organized a number of birth control centres.

China.—Despite the war the Hongkong Kowloon Maternity and Child Welfare Center reports opening a birth control clinic. Another clinic was established at the Tsan Yuk Maternity hospital. The centre is on Government premises, and is recognized by the Colonial Office.

France.—Stringent laws against birth control continue in force and the recently drafted code of the French family provides family grants, Government bounties for every child born, aid for mothers not working outside the home and loans to peasants who stay for 15 years on the land. More drastic penalties for abortion are to be part of the code.

Japan.—Japan's birth rate, owing to the Sino-Japanese war has dropped to the lowest level in 10 years. The information bureau of the War Office has issued a pamphlet denouncing birth control and late marriage and stressing the need for increasing population, as a means of conducting successfully a long range war.

Mexico.—Birth control, sponsored by the Mexican Eugenics Society, was on the agenda of the Mexican Population Congress, held in Feb. 1939, under the auspices of the Ministry of Gobernacion. Mexican officials at the Congress opposed any reduction in the birth rate and suggested a joint study of the population problem by the Public Ministry, penal courts, health departments, and Ministry of Education.

Puerto Rico.—The case against the defendants in the case of the Puerto Rico birth control clinics was presented to the grand jury in Dec. 1938, and demand was made, by the defendants, that indictments be returned in order that it might be determined whether contraceptive advice, under medical direction, was legal under the statutes passed in 1937. By stipulation the case was presented to U.S. District Judge Robert A. Cooper. In Jan. 1939, he handed down a decision in favour of the defendants, who were found not guilty of the charges against them. The Asociacion pro Salud Maternal e Infantil de Puerto Rico announced establishment of 28 centres for birth control service with 3,851 cases advised.

Russia.—*The Medical Worker*, Moscow, in a special article in January, criticized severely the type of birth control work being done in Russia and urged prosecution of factory officials responsible for the inferior contraceptive materials being manufactured in the U.S.S.R. The article pointed out that birth control was "one of the basic measures in the struggle against illegal abortion." It demanded wider education in birth control and blamed the Commissariat of Health for not supplying clinics with posters, exhibits and literature on the subject.

United States.—Merger of the two national birth control organizations, the Birth Control Clinical Research Bureau, Margaret Sanger, director, and the American Birth Control League, Richard N. Pierson, M.D., president, was effected in Feb., 1939. Mrs. Sanger became honorary chairman of the board and Dr. Pierson, chairman. The movement has been strengthened materially by the amalgamation. The new organization is called the Birth Control Federation of America, Inc., and includes not only the two major organizations with their State affiliates, but the New York City Committee of Mother's Health Centers, heretofore an independent body. The growth of clinics throughout the country has continued and there are (1939) 525 centres. Of these, in October, 203 were supported in whole or in part by public funds, and 141 were located in city or county health departments. During 1939 two southern States established contraceptive service as part of the work of their State departments of health.

Legislation.—One bill to amend and further tighten the Federal

law relating to mailing of contraceptive articles and literature was introduced in the U.S. Congress, but failed to be reported out of committee. State legislation continued to centre on placing prescription and sale of contraceptives in the hands of doctors and druggists. The Government through the Food and Drugs Administration and the Federal Trade Commission proceeded against a large number of firms charged with adulteration, misbranding, and making false therapeutic claims, or circulating false advertising of contraceptives.

Legislation in effect Jan. 1, 1940 will require that the formula of contraceptive jellies, creams, etc., in common with other proprietary articles, be printed on the package in which they are sold.

Legal Action.—In June the Waterbury, Conn. Maternal Health Center, a birth control clinic occupying rooms in the Chase Memorial Dispensary was raided by the police, and two physicians and a trained nurse were arrested, charged with violation of the Connecticut law relating to the practice of contraception. Materials and case records were also seized. In August Judge Kenneth Wynne of the Superior Court of the State upheld the demurrer of the defendants' counsel, agreeing that the State law was defective on constitutional grounds, in that it denied a physician the right to prescribe what he considered best for the health and well being of his patients. The case concerning the disposition of materials seized at the clinic was heard before Judge Frank P. McEvoy, who ordered them destroyed. Appeal was taken and the case is still pending before Judge John A. Cornell.

The U.S. District Court of Appeals for the Second Circuit affirmed the decision of the lower court in the case of *U.S. vs. N. E. Himes*, that contraceptive articles, books and pamphlets have lawful uses and are lawful in the hands of those who would not abuse the information they contain. The Customs Bureau in New York was therefore ordered to release to Dr. Himes the magazines seized, on which the suit was based. Books sent later from abroad and seized by the Customs Bureau in New York, were also released under this decision. (M. Sr.)

Birth Statistics. Birth statistics, when used in conjunction with death statistics, provide a basis by which to measure the natural increase in the population of a community. In order to compare communities with different numbers of population, birth statistics are commonly expressed in the form of birth rates per 1,000 of population. For example, there were recorded 2,287,980 births in the United States during 1938; with an estimated population of 130,215,000 in that year, the birth rate is found to be 17.6 per 1,000. England and Wales had a birth rate of 15.1 per 1,000 during 1938. Coloured persons in the United States experience birth rates much higher than do white persons, the rates per 1,000 in 1937 being 20.6 and 16.6 respectively.

Most countries of Western Europe now have a birth rate of less than 20 per 1,000—a rate which was considered low not many years ago. Thus, the Scandinavian countries, the countries of the British Isles, Belgium, France, Germany, and Switzerland, among others, had birth rates of 20 per 1,000, or less, during the period 1936 to 1938. Countries with the highest birth rates were principally in South America or Asia. The following countries had birth rates of 30 per 1,000, or greater, in the period 1935 to 1938: Chile, 33.9; Colombia, 30.6; Egypt, 43.1; India, 34.9; Japan, 30.7; Mexico, 40.4; Palestine, 42.1; Rumania, 30.6; Venezuela, 33.4. Most of these countries with high birth rates also experience high death rates (*see DEATH STATISTICS*) and high infant mortality (*see INFANT MORTALITY*). Birth rates as high as the foregoing would undoubtedly be found in many populous countries which at present have no adequate system for recording births. Table on page 97 shows birth rates for a number of countries.

Average Annual Birth Rates per 1,000 total population in certain countries for the period 1936 to 1938 and for each year in the United States from 1915 to 1938 and in England and Wales from 1900 to 1938

Country	Birth Rates per 1,000 1936 to 1938	Year	Birth Rates per 1,000	
			United States (c)	England and Wales
North America		1900	..	28.7
United States	17.1	1901	..	28.5
Canada	20.1	1902	..	28.5
Mexico	40.4	1903	..	28.5
South America		1904	..	28.0
Argentina	24.2			
Chile	33.9	1905	..	27.3
Colombia	30.6	1906	..	27.2
Uruguay	20.0(a)	1907	..	26.5
Venezuela	33.4	1908	..	26.7
Europe		1909	..	25.8
Austria	13.3			
Belgium	15.4			
Bulgaria	24.0	1910	..	25.1
Czechoslovakia	17.4	1911	..	24.4
Denmark	18.0	1912	..	24.0
Eire	19.4	1913	..	24.1
England and Wales	14.9	1914	..	23.8
Estonia	16.2			
Finland	19.6(a)	1915	25.1	21.8
France	14.8	1916	25.0	21.0
Germany	19.1	1917	24.7	17.8
Greece	27.6(a)	1918	24.6	17.7
Hungary	20.0	1919	22.3	18.5
Ireland, Northern	20.0			
Italy	23.0	1920	23.7	25.5
Latvia	18.1	1921	24.2	22.4
Lithuania	23.0	1922	22.3	20.4
Netherlands	20.2	1923	22.2	19.7
Norway	15.2	1924	22.4	18.8
Poland	25.2			
Portugal	27.4	1925	21.5	18.3
Rumania	30.6	1926	20.7	17.8
Scotland	17.8	1927	20.6	16.7
Spain	25.9(b)	1928	19.8	16.7
Sweden	14.5	1929	18.9	16.3
Switzerland	15.3			
Yugoslavia	28.8(a)			
Asia		1930	18.9	16.3
India, British	34.9(a)	1931	18.0	15.8
Japan	30.7(a)	1932	17.4	15.3
Palestine	42.1	1933	16.5	14.4
Other Countries		1934	17.1	14.8
Australia	17.3			
Egypt	43.1(a)	1935	16.9	14.7
New Zealand	17.3	1936	16.7	14.8
Union of South Africa		1937	17.0	14.9
(Whites)	24.6(a)	1938	17.6	15.1

(a) Average for 1935 to 1937.

(b) Average for 1934 and 1935.

(c) Official data begin with 1915. For years prior to 1933, the birth rates relate to an expanding area within the United States.

Birth rates have been declining rapidly since the beginning of the century in practically all important countries of the world. Thus, England and Wales experienced a decline in the birth rate from a level of 28.7 per 1,000 in 1900 to a point half that, namely, 14.4; by 1933; since then there has been a slight upward movement. The birth rate in the United States fell from 25.1 per 1,000 in 1915, the earliest year of official record, to a low point of 16.5 in 1933; however, by 1938 the rate had risen to a point higher than that for any year since 1931. A long time view of the trend in birth rates may be gleaned from the record for Sweden. Birth rates as high as 35 per 1,000 were common there in the middle of the 18th century. Rates as high as 33 were found even as late as 1861-65. The decline which set in thereafter has been particularly marked since 1920, when the rate was 23.6, by 1938 the rate was only 14.9 per 1,000.

Birth rates can also be computed per 1,000 women of a given age in the population; they are then known as age-specific fertility rates. Such figures vary widely with the age of the mother within the reproductive period of life.

Thus, in the United States during 1937, the fertility rates per 1,000 white females within successive five-year age groups were: 15 to 19 years, 41.3; 20 to 24 years, 118.3; 25 to 29 years, 107.7; 30 to 34 years, 73.4; 35 to 39 years, 43.8; 40 to 44 years, 14.9; and 45 to 49 years, 1.5.

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Bledsoe, Samuel Thomas (1868-1939), American railroad president, was born near

Albany, Ky., on May 12. After studying law for a year at the University of Texas he was admitted to the bar in 1890 and began practice at Ardmore, in the Indian Territory which is now a part of Oklahoma. Later he was an attorney in Guthrie, Okla., and Oklahoma City. In 1908 he became a solicitor for the Atchison, Topeka and Santa Fe railway. He was appointed general counsel for the railroad in 1918 and chairman of its executive committee in 1930.

In 1933 he became president. Mr. Bledsoe, who was author of a volume on Indian land laws, died at his Chicago home on March 8.

Blitzkrieg: see LIGHTNING WAR.

Blockade. The maintenance of an effective sea blockade by Great Britain of Germany from 1914 to 1918 contributed in a great degree to the Allied victory. Blockade, by international law, cannot be recognized as legal unless it is rendered effective by force. In short, a blockade in order to be binding must be effective. The rights of visit and search, and contraband cargo are closely associated with the practice of blockade. Prohibition is enforced by a confiscation in the blockaded zone or near the area of operations of all ships and cargoes that attempt to sail to or depart from the prohibited ports or coast in violation of standing orders and declarations of the blockader. "Command of the sea" gives the naval power that holds it the force to blockade an enemy and control his trade. Thereby may a superior naval power not only deny an enemy the use of the sea but also deny neutrals carrying contraband ingress to enemy ports, and by withholding commodities and strategic raw materials reduce materially the fighting strength of a state. In the World War, 1914-18, Great Britain never formally declared a blockade of Germany. This was because it was impossible for the British fleet to blockade Baltic German ports and prevent trade by Scandinavian countries with Germany.¹

Britain's patrol and blockade squadrons went on stations Sept. 3, 1939, following much the same lines as in 1914. Great Britain did not declare a formal blockade, but issued on Sept. 3, 1939 a proclamation of lists of contraband that covered practically all imports to Germany. The term "blockade" as used in both wars is technically incorrect in the legal sense, but suggests the machinery used to bring economic pressure on the enemy of the Allies. On September 9, the British Government stated that "to prevent contraband from reaching the enemy His Majesty's Government will use their belligerent rights to the full."

Guns, ammunition, equipment, food, and all that aids directly military-naval forces were classed as absolute contraband. All goods that might be eventually used for war purposes such as food, fodder, clothing, and so forth, were classed as conditional contraband. Thus British sea power at the outset of the present war commenced to exert an economic pressure by blockade that has been defined as "an act of war carried out by the warships of a belligerent, detailed to prevent access to or departure from a defined part of the enemy's coast." The British Isles occupy an unusually favourable strategic position to permit her superior sea power to control the line of sea communications bordering on the North sea.

Blockade in the early days of its exercise was maintained by the close blockade and reached its perfection in the wars of Great Britain against the French Revolution and the French Empire. The blockade of the South by the Northern Navy in the American Civil War was a determining factor in the outcome of that war. But by this time new weapons had begun to challenge the close

¹All assertions or opinions contained in the above article are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or of the Naval service at large.

blockade, that is, the mine, the submarine, and the torpedo. The tactical or close blockade was seriously questioned as to its effectiveness by naval experts after the Russo-Japanese War, when Admiral Togo, the Japanese admiral before Port Arthur, lost two battleships by mines. This was one-third of his major force, and for that reason Togo had to relinquish his tight grip on the port. The long range naval blockade came into effect at the outbreak of the World War 1914-18, and now exists in the present conflict.

Prior to 1914, German naval strategy had been based, in the event of a conflict with Great Britain, upon a general conception that the British Grand Fleet would maintain a close blockade of the Heligoland bight and the German coast on the North sea. This would provide opportunity for German counter-attacks by submarines and highly trained and efficient torpedo flotillas. Thus by attrition of a superior fleet could the near parity be reached that would permit the German High Seas Fleet to engage the British Grand Fleet with reasonable chance of success. The British fleet did not maintain a close tactical blockade, but instead maintained a long range strategical blockade with small craft reporting on movements of the German High Seas Fleet. This form of long range blockade with the British Grand Fleet in a favourable position at Scapa Flow, Scotland, had then as now the following advantages: (a) it does not unduly hazard the British capital ships by attack from enemy surface vessels, submarines, or shore-based aircraft; (b) it permits the British main body to remain concentrated in order to engage in force the German fleet should it emerge in the North sea; (c) it provides greater control of the ingress and egress of shipping to the neutral countries. The disadvantages are: (a) the German fleet may emerge to make sporadic raids on the British east coast and, with luck, return to German bases; (b) such a remote concentration of British forces gives greater freedom of action to German naval units cruising in the North sea.

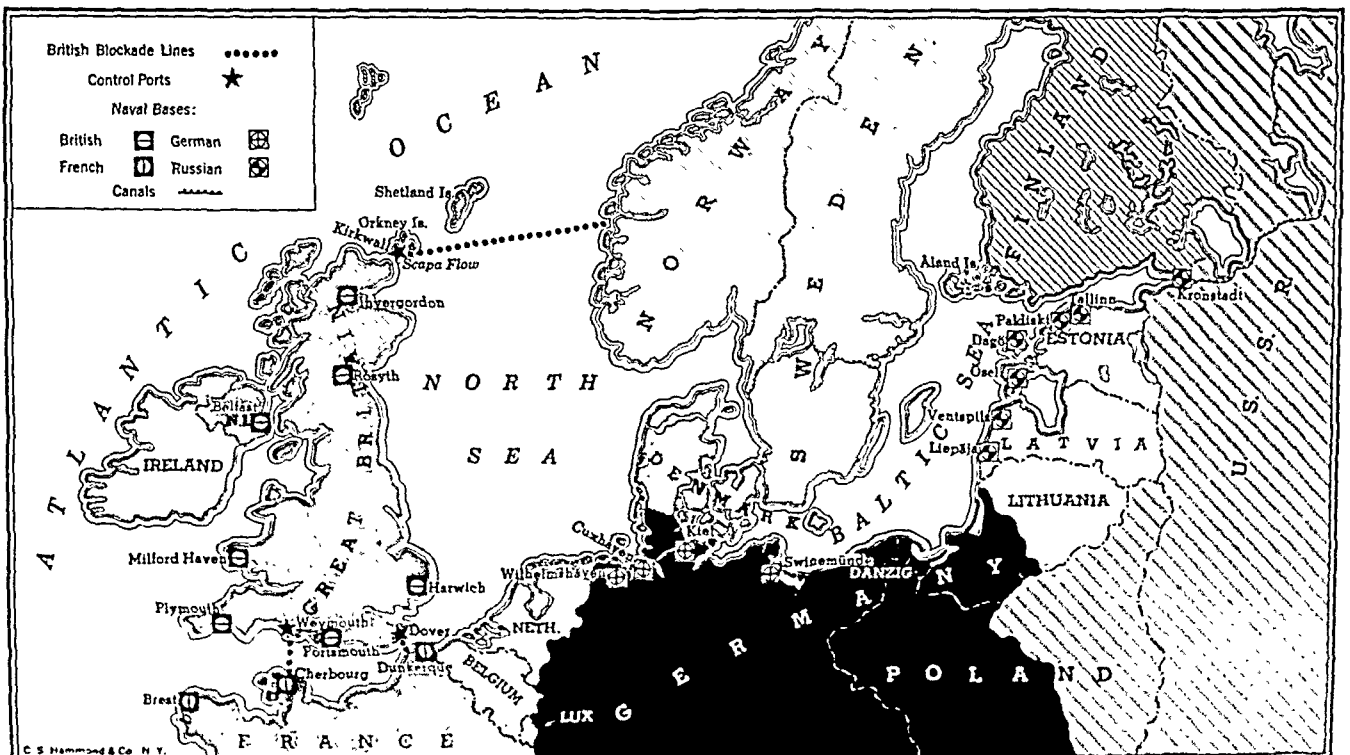
British blockade (Jan. 1940) is maintained by a patrol or reconnaissance force of submarines, destroyers, and planes, close in to

Heligoland bight and the approach to the Skagerrak. Because of the attacks by shore-based German aircraft this is extremely dangerous duty. The British Grand Fleet is concentrated mainly at Scapa Flow and the Firth of Forth, ready for instant action with the German fleet. The straits of Dover are blockaded by mine fields and patrolling squadrons. The British have planted mine fields off Heligoland and from 5° E. Longitude eastward to near the mouths of the Elbe-Weser. The Germans extended this field to the westward. At the year's end, 1939, the British commenced to lay a defensive protective belt of mines to the eastward of England and Scotland from 8 to 10 miles off shore, stretching from Moray Firth to the Thames. A patrol of large armed merchant vessels called auxiliary cruisers is maintained south of Iceland to the Norwegian sea in a general northwest and southwest line. This patrol utilizes a base in the Shetland islands.

The Royal Air Force makes reconnaissance flights over the North sea with regularity and has made several raids on the defended island of Heligoland. The blockade in its entirety has had the general effect of cutting Germany off from nearly all overseas sources of supply. Thus does modern blockade, with a vast organization of air and sea patrols, and a "fleet in being" ready to meet the inferior force of German sea power, propose to maintain for a sufficient length of time an effectual grip and control on shipping in order to effect an economic stranglehold on Germany: the ultimate purpose of which is to undermine the national morale and hasten the decision.

To date, air power has not shown the success that many experts predicted for it in attack on surface vessels. It is perhaps too early in the present struggle to evaluate correctly the capability of air power to maintain or dispute a sea blockade. The potentialities and possibilities of the air arm are known because direct air attacks are now being made on ships by shore-based planes, although to date hits have been few and damage slight. The aeroplane renders great assistance in controlling sea communications by extending the area of vision of surface vessels. Aeroplanes may also attack submerged and surface vessels hundreds of miles from carriers. Blockading vessels must now be ever ready to resist air attack.

BRITISH BLOCKADE lines and control ports. Gibraltar and Haila are also ports of control for suspected contraband





SUSPECTED CARGO being examined by naval and customs officers for the British contraband control early in Oct. 1939

Naval bases wherein large ships or fleets are concentrated must, in the present war, be provided with air security. Blockades and counter blockades now utilize surface vessels, submarines, and aircraft. Although aircraft has not revolutionized blockade, it has caused air security for blockader and blockaded to become a vital defence requirement.

The control of neutral shipping to enemy ports or contiguous areas requires a highly complicated organization in the modern accepted version of "economic warfare." Before the World War, 1914-18, ships in a blockading squadron searched neutral vessels at sea and there examined the cargoes for contraband. Because under modern conditions, with hostile submarines at sea, it was found practically impossible to search ships at sea, vessels suspected in the World War of carrying contraband to neutrals or to Germany were sent into British ports for inspection. Search at sea was considered inadequate and dangerous because of the hazard to ships stopped of being torpedoed by hostile submarines. The ports destined for such inspections are called control ports. All ships bound for Germany or contiguous neutral countries have been advised to call at these control bases. For example, 48 neutral ships were being held on Dec. 26, 1939, in three contraband control bases in the United Kingdom.

The Ministry of Information announced Sept. 8, 1939 that the British Government had established contraband control bases at Kirkwall, Weymouth, and the Downs (North Foreland) in the United Kingdom, and abroad at Gibfaltar and Haifa. Before the end of 1939, the French and British Governments established further control bases at Oran, Marseilles, Malta, Port Said, Aden, Dunkirk, and Le Havre. To assist the blockade, the British decreed that: "Vessels bound for enemy territory or ports in neutral countries from which goods can conveniently be forwarded to enemy territory are urgently advised to call voluntarily at one of the control bases, in the United Kingdom, preferably at Weymouth.

"If they do so and it is established that they carry no contraband, they may be given a pass to facilitate their onward journey."

This important control of cargo inextricably associated with sea blockade is regulated in Great Britain by a Ministry of Economic Warfare, which corresponds closely to the Ministry of Blockade as set up in 1915. This vital offensive arm of economic warfare and blockade had a complete staff drawn from Civil Service and ready to function in the first week of European war. Sea power took the first step by establishing a blockade of the German North sea coast. The Ministry of Economic Warfare was prepared to inspect in port all vessels detained. On Oct. 25, 1939, Ronald Hibbert Cross, the British Minister of Economic Warfare, stated that in the first six weeks of the war, 338,000 tons of goods had been intercepted or detained. All contraband comes under the Admiralty Marshal until a prize court sits and decides the ultimate disposition.

Sea power distributed over stations far from the North sea is utilized for the purpose of maintaining an effective blockade. Three days after Great Britain declared war against Germany, the machinery for operating the contraband control at the strait of Gibraltar commenced to function, for British destroyers began a few days before a state of war existed to patrol the strait, as they had in Sept. 1938. This patrol stopped 30 or 40 vessels of all nationalities passing through the strait each day to examine papers and determine whether or not the ships carried contraband.

Sea blockade has usually led to expedient measures of interpretation of international law on the part of the blockader and retaliatory measures on the part of the blockaded. The Declaration of London of Feb. 26, 1909 (never ratified by the powers) was, nevertheless, prior to the World War, 1914-18, the basis for instructions relative to contraband as given by the principal powers to their navies in the event of war. The United States suggested at the outbreak of the World War of 1914-18 that the belligerents adopt its stipulations as well recognized provisions of international law. Great Britain at that time received accurate information that Germany was receiving large cargoes of grain that were being unloaded in Rotterdam, Holland, and shipped to Germany by way of the Rhine. The Allies then answered the United States by the British Order in Council of Aug. 20, 1914, and the French Declara-

tion of Aug. 25, 1914, that the Allied powers would apply the Declaration of London, but pointed out a marked departure from its stipulations as regards conditional contraband. The decree of Aug. 25, 1914 modified the Declaration in order to give the Allies positive facilities for stopping conditional contraband destined to the various neutral ports of the Baltic and northern Europe. Britain exported considerably to these countries throughout the World War. Restrictions were increased by the Allies in an Order in Council of October 30 that made it incumbent on the owners of captured conditional contraband cargoes to prove that the goods were not destined to the enemy country, although shipped to a neutral state. This Order in Council also set forth a voluminous list of contraband goods, with many items which the Declaration of London stipulated should never be called contraband.

The United States Government in a long note strongly protested and concluded that American trade to the neutral states near Germany was suffering by such illegal restrictions. The British Government replied on Jan. 7, 1915, by forwarding a table of the relative exports from New York to the neutral states and pointed out that exports to Denmark for Nov. 1913 amounted to \$558,000 but were more than \$7,000,000 for Nov. 1914. Great Britain, in this note, also stated that in the American Civil War the United States for the first time applied the doctrine that goods were liable to capture destined to an enemy port even though transshipped from an intervening neutral port. It was also recalled that Prince Bismarck, in 1885, when asked whether or not foodstuffs which were not destined for the enemy forces could be seized, replied: "The measure in question has for its object the shortening of the war by increasing the difficulties of the enemy, and is a justifiable step if uniformly enforced against all neutral ships."

The exercise of the right of search in port was strongly disputed by some neutrals in the World War, 1914-18, but an effective organization comparable to the present Allied "economic warfare" control was finally effected. This Allied blockade organization was later augmented by assistance from the United States after her entry in the war. The main work comprised a study and control of exports and imports of the northern neutrals, as well as negotiation and administration of agreements with these northern states; while throughout, as in the 1939 war, sea power provided the effective control of all shipping.

In 1915, the economic blockade enforced by superior sea power began to tell on Germany. This was one of the main reasons for the first German declaration of submarine warfare which stated that from February 18 onward as a retaliatory measure, all hostile merchant ships met in British or Irish waters would be sunk without regard for the crew or passengers. The economic pressure on Germany became so great and the need of commodities and strategic war materials so pressing that the Emperor of Germany, on Jan. 19, 1917, signed the following order: "I hereby order unrestricted submarine warfare to be commenced on February 1 and to be prosecuted with the utmost energy." This led to the torpedoing of American ships flying the American flag, leading to an incensed American public opinion that caused President Wilson to announce to the Senate on Feb. 3, 1917, that diplomatic relations had been broken with Germany. Three more American steamers were torpedoed and on April 6, 1917, the President of the United States declared that a state of war existed. Thus did the United States enter the war, mainly as a result of Germany's counter blockade measures. The United States then co-operated with the Allies by assisting in the blockade of the Central Powers and by furnishing troops, money, and supplies. The strongest open attack on the 1939 sea blockade by Great Britain of Germany was made by the Soviet Government in a note of Oct. 25, 1939. It declared: (1) that the British contraband lists violated international law, injured legitimate neutral trade, and led to results

comparable to those of air bombing in their effect on the civil population; (2) that the system of controlling neutral merchant ships violated elementary principles of freedom of neutral shipping in wartime; and (3) that the Soviet Government reserved the right to claim compensation for injuries due to these measures. British authorities replied that their methods of economic blockade were legal under international law, and admitted that damages arising from loss of Soviet ships were complicated because of Government ownership of ships and cargoes.

The World War (1914-18) demonstrated the ability of the submarine to act as a powerful counter-blockade weapon. Great Britain was reaching a critical shortage of food because of her merchant ship losses by "U" boats when the United States entered the war in 1917. In short, the German Navy was going behind the blockade and striking at maritime "sinews of war," Allied overseas trade. The adoption of the convoy and escort system, the organized search for "U" boats, and the entrance of the United States in the struggle saved the day.

In the 1939 conflict, Germany's methods of attack, as in 1915-18, on seaborne commerce has been rather closely followed with the addition of the laying of anchored, and possibly drifting, "magnetic" mines by German submarines and aircraft. (*See SUBMARINE WARFARE.*) The convoy and escort system; numerous patrol units, surface and air; searching for submarines; trawlers utilized for mine sweeping; and the laying of a defensive mine field on the east coast of England and Scotland by the British had, by the end of 1939, greatly reduced the sinkings of Allied and neutral ships.

In any consideration of the 1939 blockade, two points are important. First, Allied sea strategy is based upon keeping the seas clear of enemy ships in order to protect Allied and neutral shipping by controlling all sea communications to the British Isles and France. Second, by means of the blockade, ingress and egress to the Baltic is controlled with the hope of achieving the economic strangulation of Germany. The main German fleet is contained and every attempt would be made by the British to bring it to action if it emerged. Thus is the existing blockade both of the offensive and defensive type. Mahan defined this function of the strategy of the stronger sea power in blockade when he wrote:

Whatever the number of ships needed to watch those in an enemy's port, they are fewer by far than those that would be required to protect the scattered interests imperilled by the enemy's escape. Whatever the difficulty of compelling the enemy to fight near the port, it is less than that of finding him and bringing him to action when he has got far away.

In the past 100 years the technique, and the means of maintaining a blockade have changed considerably, but the classical conception of "command of the sea" remains the essential condition upon which the success of any blockade rests. (*See also EUROPEAN WAR; INTERNATIONAL LAW; SHIPPING, MERCHANT MARINE.*)

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Blood Bank: *see* GYNAECOLOGY AND OBSTETRICS.

Blowfly: *see* ENTOMOLOGY.

Bohemia and Moravia. These two former provinces of Czecho-Slovakia (*q.v.*) form since March 16, 1939, a German Protectorate. Their area is 12,525 sq.mi. for Bohemia and 6,533 sq.mi. for Moravia. The population according to the census of Dec. 1930 amounted to 4,472,354 for Bohemia and 2,332,522 for Moravia. The density of population per square mile at that time was 357. The annexation of Bohemia and Moravia by Germany has not been recognized by the United States, Great Britain, and France, and these countries are treated as representing independent Czecho-Slovakia. In this Protectorate

some formal autonomy is left to the Czech Government. The head of the State is Dr. Emil Hacha, the former president of the short-lived Czecho-Slovakia as it emerged from the negotiations at Munich at the end of Sept. 1938. The Czech Government was constituted on April 27 with General Alois Elias as Prime Minister. The real influence in the Protectorate, however, belongs to the German Government which is represented by the Reichsprotektor, Baron Konstantin von Neurath. Under him the secretary of the Protectorate, Karl Hermann Frank, one of the most extremist and ruthless leaders of the former Sudeten German movement, controls the whole political, economic, and cultural life of the Protectorate. The Czech autonomy in all three respects was reduced to a mere shadow.

A systematic policy of Germanization was introduced. Many Czech workers were sent out into Germany, whereas very many Germans settled, as farmers, officials and workers, in the Czech territory. The capital, Praha, had a large influx of Germans, and in Moravia a broad belt at the eastern frontier was densely settled with Germans so as to separate Bohemia and Moravia as the most western Slavs from the Slovaks and other Slav peoples of the east, and to subject them with greater rapidity to the process of Germanization. The German language was introduced as the official language, although the Czech language was tolerated for the transaction of purely internal Czech affairs as a second official language. A large number of new German schools were founded; in all the Czech schools new text books were introduced teaching National Socialist principles instead of Czech traditions. A decisive blow against the Czech people was struck by the closing down of all Czech universities and colleges in Nov. 1939. They were supposedly closed for three years, but their laboratories and libraries were removed to Germany, most of the professors and many students sent to concentration camps, and the intention was clear to deprive the Czechs of the possibility of forming an intellectual leader class, and thus to put them into the position of a helot race, subservient to the German master race. Five of the largest provincial towns, of which four in Moravia, Brno, the capital of Moravia, Olomouce, Moravska Ostrava, and Jihlava, besides Ceske Budejovice in Bohemia, were put under German Commissars after the dismissal of the Czech mayors and town councils. Czech economic life was transformed so as to be purely complementary to the German economic system and to work for its needs.

This policy of Germanization is helped by the complete isolation in which Bohemia and Moravia are held. They are shut off from the outside world, from where no broadcasts or newspapers are allowed to penetrate into the Protectorate. So well protected are the Czechs that travellers, even Germans, need a special permission to enter their territory, a permission only rarely granted. Thus the martyrdom of the Czech people goes on, unobserved by the outside world. All manifestations of Czech nationalism are forbidden. The persecution of the Jews after the model of National Socialist Germany has been introduced against the will of the Czech people into Bohemia and Moravia. They are subjected to restrictions similar to those in Germany, and the transfer of some of them to the Jewish "reservation" in eastern Poland started before the end of 1939. (See also ANTI-SEMITISM.)

In view of this difficult situation the Czechs are trying successfully, so far, to maintain national discipline and unity. They have formed a Party of National Unity which accepts all male Czechs of over 20 years. The efforts of the National Socialists to create a Czech Fascist Party have met so far with only very little success, although these Czech Fascists are heavily subsidized by German funds and helped in every way by the German secret police. Their daily newspaper, *Vlajka*, has a very small circulation, although, of course, the whole Czech press, under strictest control



"THEY WON'T STAY BURIED," remarked Shoemaker of *The Chicago Daily News* when Eduard Benes announced Sept. 6, 1939, that Czechs would form a legion to fight Germany

and much reduced in numbers, has lost much in circulation, for the readers find there only the monotonous news of German propaganda. The small Czech Fascist group concerns itself mostly with anti-Semitic demonstrations and provocative acts. Knowing the ruthless methods of National Socialist suppression of all opposition movements, the Czechs have, as far as possible, shown a remarkable restraint. Only on Oct. 28, 1939, the 21st anniversary of the Declaration of Independence of Czechoslovakia, peaceful manifestations of Czech students turned into clashes with the police. The funeral of a student, who had been a victim of these clashes, led in the middle of November to demonstrations on the part of the students. The result was the execution of a number of students, the imprisonment of thousands of students and intellectuals in concentration camps, and the closing of all institutions of higher education for three years. According to reliable reports, many Czech workers committed acts of sabotage, holding up the production of German armaments.

The outbreak of the European war did not affect the Czechs directly as they remained officially "non-belligerent." Needless to say that all their sympathies were on the side of the Western democracies and that they expected from their victory the liberation from the National Socialist Protectorate. Many Czechs put also, at the beginning, their hope in Russia, because the pan-Slav sympathies are strong and ancient with the Czechs. A large number of Czechs under General Leo Prchala, who had succeeded in escaping from Czechoslovakia in the spring of 1939, fought in the Polish Army. Following the example of the World War (1914-18), the Czechs organized in Bohemia and Moravia a secret underground movement, the Maffia, which prepares the ground for the hoped-for hour of liberation and maintains close contact with the Czech emigration in the Western democracies. The former president of Czechoslovakia, Dr. Eduard Benes, who has lived since Oct. 1938 in Great Britain and in the United States, became the head of a Czechoslovak National Committee, which was organized in the fall of 1939 in France and was officially recognized

by the French Government as the representative of the Czechoslovak peoples. The committee, which is composed of seven members, among them Mgr. Jan Sramek, the former leader of the Czech Catholic Party, was authorized to reconstitute in France the Czechoslovak Army to fight at the side of the Western democracies for the liberation of Bohemia and Moravia. In an exchange of letters of December 20 between the British Foreign Secretary, Lord Halifax, and Dr. Eduard Benes, the British Government recognized officially the committee as representing the Czechoslovak peoples and promised full co-operation in the reconstitution of the Czechoslovak Army. (See also CZECHO-SLOVAKIA.) (H. Ko.)

Bolivia, a South American inland republic on the Southern Andean plateau; language, Spanish; capital, La Paz; provisional president, Carlos Quintanilla; area: 419,470 square miles. The population, as officially estimated in 1937 (on the basis of the census of 1900) is 3,226,965, with 50.9% Indian, 26.8% mestizo (Indian and white admixture), 12.7% white, and 9.6% "unspecified." The chief cities, with populations (official estimates, 1936), are: La Paz, 202,000; Oruro, 44,826; Cochabamba, 36,874; Potosí, 28,492; Sucre, 27,508.

History.—During 1939 Bolivia continued to have the political instability which had characterized her especially since 1930. On April 24, her 35-year old dictator-president, Lieut. Col. Germán Busch Becerra, created an international sensation when he announced assumption of "totality of powers." Suspending the constitution he dissolved congress and the courts and cancelled the congressional elections scheduled for May 4. Although the new move was officially described as "Bolivian in nature" and designed to "redeem Bolivia from chaos," it was generally regarded as indicating a close economic tieup with the totalitarian powers of Europe. On May 12, several leading opponents of the Government were arrested and confined in a concentration camp. On May 25 publicity concerning payments exacted of Jewish refugees by Bolivian consuls in return for valueless "passports" created a scandal and forced the resignation of the foreign minister. His successor resigned, August 3, in protest against the formal nationalization of the Central Bank of Bolivia. Three weeks later (August 23) President Busch died of a gunshot wound. Officially, his death was "suicide," but many observers regarded it as assassination. His minister of war, General Carlos Quintanilla, succeeded as provisional president. The new president pledged restoration of "constitutional normality," and suspended censorship and press restrictions (September 27); presidential elections were called for March 7, 1940. On October 27, however, Colonel Bernardino Bilbao Rioja, commander of the army and an avowed presidential candidate, was deported to Chile "for planning a revolution." Several days of near-revolutionary disorder followed.

Education.—There are more than 2,000 primary schools, with enrolment of around 145,000, and three universities, at La Paz, Sucre, and Cochabamba.

Finance.—The monetary unit is the boliviano (value: approx. 2½ cents U.S.).

Trade and Communication.—External communication is by rail to Arica and Antofagasta (Chile), to Peru by rail and lake steamer (on Lake Titicaca), by rail to Argentina, and by regular air service. There are 1,399mi. of railway in service. An international railway connecting with the Brazilian port of Santos is under construction. The principal highways aggregate over 5,000mi. in length with a further 1,000mi. under construction or in project. Except for 14mi. the Bolivian section of the Inter-American highway (897mi.) was entirely open in 1939.

Exports are 97% mineral (70% tin), and aggregated 94,830,000 bolivianos gold (one gold boliviano=36½ cents U.S.) in 1938

(124,599,000 gold bolivianos in 1937). Imports (manufactured goods and foodstuffs) were 70,559,000 bolivianos (59,234,000 in 1937).

Agriculture and Minerals.—Bolivia ranks third in world production of tin. Silver, tungsten, antimony, lead, zinc, copper, gold, sulphur, and bismuth are also produced in important quantities. Oil resources are only slightly developed. Agriculture falls short of domestic needs. (L. W. BE.)

Bonds. From the American panic of 1873, which had its European counterpart, there was a sustained uplift in Government bond values for 26 years to a zenith in 1899, when prices were double those of the previous nadir. The ensuing 21-year decline to 1920 reached depths not much less than in 1873. The 1914-18 World War may have been responsible for the extremity of that decline. In the U.S. the upsurge since 1920 has continued 19 years to an all-time high point, although technical indications are not wanting of an impending reversal.

However that may be—since the beginning of 1935 the long term Government bonds of the United Kingdom parted price-company with those of the United States and began to decline, so that instead of yielding 2½%, or less than United States bonds, they are now offering a return of around 4%, or nearly twice as much. Charge that reversal of credit largely to war preparation.

Likewise, in the World War (1914-18) the value of British Governments declined from the outbreak of the spring of 1917 in opposition to a moderate advance of United States Governments during the same period when American participation was not commonly expected. But on the entry of the United States into the war the moderate intermediate uptrend of the American national loans was reversed and they declined in close sympathy with British Consols until the long time lows of 1920 and 1921 were realized for both countries. It was the war service of the author to assure the American people on coast-to-coast tours during all the Liberty loans and the Victory loan that the resumption of peace would pave the way for enduring (but not necessarily everlasting) revival of high grade bond values, so that each bond buyer could rely on interest upon the money he loaned the Government and eventual total dollar return of his principal. No such assurance could be given intelligently now for not only has the Government deliberately and without impelling provocation repudiated its countless promises to pay in gold, and has otherwise devalued its money, but also has bolstered its funded debt by over \$20,000,000,000 to the statutory limit—fulfilling a notorious boast "we shall tax and tax, spend and spend, elect and elect."

Nothing can be more certain than that the entrance of a nation into war will more definitely date its credit decline than anything else, nor that, other things being equal, resumption of peace, and of trade, will retard or reverse that decline. If Great Britain and its overseas dominions emerge from the European war retaining their industrial primacy we shall not see the creditors of her funds paid about 4% as now while creditors of the United States are paid about 2%. If the United States enters the war, history and reason lead us to expect that British Consols will decline somewhat further and that Federal Government bonds will decline promptly and exceedingly and will seek a similarly low level.

The post-war future of American Federal credit, whether the country becomes a belligerent or not, is not so simply projected. America emerged from the previous war with what, for it then, was the unprecedented debt of \$25,000,000,000, but one which, thanks to post-war business revival and a national debt-paying tradition abetted for 11 years by the able Secretary of the Treasury, Andrew Mellon, restored the national credit. The funded liabilities were thereby reduced by about \$9,000,000,000.

But the true funded assets of the nation were even more greatly reduced. About \$13,000,000,000 due the United States by European and other nations, particularly before the entrance of the former into the war—credits arising from the sale of exigent supplies charged at punitive prices—were, with the notable exception of Finland, generally voided. Simply it became more convenient to default than to honour, especially as the United States made no noteworthy effort to offer goods at European price levels to facilitate payment. Europe did not have the gold and therefore Europe defaulted.

Under less statesmanlike policies than those which guided Mellon and his contemporaries the Government since the year 1933 has accumulated a still more unprecedented debt now totaling \$41,000,000,000, apart from \$11,000,000,000 of contingent liabilities, by encouraging an artificial credit ease and creating fictitious prices for its bonds. (See also BANKING; STOCK EXCHANGES: *Stocks and Bonds*.) (L. CH.)

Bonneville Dam: see ELECTRIC TRANSMISSION AND DISTRIBUTION; OREGON.

Bonus: see ADJUSTED COMPENSATION.

Book-collecting. Bibliography is a living and occasionally a lively science. The book-collector of today, in order to prosecute his pursuit intelligently and with the highest enjoyment, must perforce be some part bibliographer. So equally must the bookseller. In America and England alike much of the rare-book trade is now in the hands of alert young men who combine the attributes of merchant and of scholar—a mixture that would once have been regarded as grossly incompatible.

The alliance bore noble fruit in 1934 with the publication of *An Enquiry into the Nature of Certain Nineteenth Century Pamphlets*, by John Carter and Graham Pollard, London booksellers, the former the representative of a New York house. The *Enquiry* exposed as sheer fabrications a quantity of rarities stemming from a common source whereof the most recherché was Mrs. Browning's *Sonnets* (sc. *from the Portuguese*), allegedly issued in 1847. This bibelot has sold for as high as \$1,250.

The Carter-Pollard disclosures, without naming him, pointed at Thomas J. Wise, founder and owner of the Ashley library and compiler of the notable eleven-volume catalogue of that surpassing collection. Wise did not manage his rebuttal effectively; he died in 1937 under a cloud, and his books were acquired by the British Museum.

Late in 1939 another engrossing contribution appeared in Wilfred Partington's *Forging Ahead*, subtitled "the True Story of the Upward Progress of Thomas James Wise, Prince of Book Collectors, Bibliographer Extraordinary and Otherwise." Mr. Partington could say what Messrs. Carter and Pollard could not, and he did. Much technical investigation into Wise's activities remains to be prosecuted; meanwhile his inventions have taken on a certain réclame purely as inventions; in the spring of 1939, although its spurious state was familiar to the whole world of bookmen, a copy of Mrs. Browning's *Sonnets* sold for \$105. The collecting world rejoices in the fact that the exposure was initiated and carried through by booksellers. The fact is abundant proof of the alertness and awareness of the contemporary book trade.

Less spectacular research is continually being carried on, particularly in the large institutional collections. The annual reports of such admirable (and admirably supervised) libraries as the Huntington, the John Carter Brown, the Chapin, the Wrenn, the Clements, and the American Antiquarian Society briefly set forth the activities which are being prosecuted in these great repositories. The *News Sheet* of the Bibliographical Society of America regularly lists a schedule of bibliographical work in progress. At

least two important compilations which were cited as in progress a year ago—Dr. Wilfrid Parsons' *Bibliography of Early Catholic Americana* and Lyle H. Wright's *Bibliography of American Fiction 1774-1850*—appeared in finished form during 1939. (J. T. W.)

Booklist: see AMERICAN LIBRARY ASSOCIATION.

Books: see CHILDREN'S BOOKS; PUBLISHING; see also under LITERATURE.

Book Sales. War acts both as brake and as stimulus to the collecting activity, and the passage of time is necessary in order to determine whether retardation or acceleration is to be the dominant characteristic. It is significant that the autumn of 1939 found the English rare-book trade devoting as much attention as heretofore to the potential American buyer, even though catalogues bore unfamiliar suburban and even rural addresses. But bibliopoly is one facet of commerce which can be conducted far from the great financial capitals. America itself offers convincing proof of this. The crossroads bookstore has become a familiar phenomenon of the countryside, and while its over-the-counter traffic may be negligible, this is an advantage to the proprietor in that it gives him abundant leisure for the compilation and dispatch of catalogues to the four corners of the nation. It will be interesting to note whether peace will find some of the English dealers continuing to take advantage of the greater space facilities and reduced overhead available well beyond the metropolitan area and the larger provincial centres.

The American auction season of 1938-39, while not without its points of high interest, was in the main a somewhat pedestrian affair. The most expensive offering was the Ormond G. Smith copy of the first folio Audubon *Birds of America* (1832-39), which brought \$11,700. This noble monument to Anglo-American co-operation is proof against the accidents of time and change; if one accepts the "investment book" theory a folio Audubon must fulfill all his requirements, provided he has space to store it, since each of its 400 plates has an area of nearly eight square feet. The *Birds of America*, to be sure, did not initiate its career as a cheap book; the original subscription price just a century ago was \$1,000.

The season just closed also witnessed the unusual offering of a Poe *Tamerlane* (1827). Despite its far from pristine condition—"back wrapper and backstrip lacking, piece torn from top inner corner of front wrapper, affecting border; wrapper soiled; some leaves faintly time-faded or soiled; traces of dog-ears at corners"—it brought \$4,300. No copy had appeared at public sale since the Halsey (1919), which brought \$11,600, although two copies changed hands privately during the 20-year interval at around \$15,000 each. There are rarer books—there are rarer Poes—but *Tamerlane*, deservedly or not, has become the touchstone of American bibliophily, and the announcement of the discovery of an unrecorded exemplar is always breath-taking.

But the book-auction traffic of today is not conducted exclusively in thousand-dollar units. A most encouraging sign of recent months, indeed, has been the growth of small auction houses where sales are consummated at as low as 25 cents. The price-range of books obviously knows no limits in either direction. (J. T. W.)

Borneo, an island in the East Indies, is divided politically into the British protectorate of Brunei; the independent States of North Borneo and Sarawak, both under British protection; and Dutch Borneo.

British Borneo.—Area, total c. 72,000 sq.mi.; pop. (est. Dec. 31, 1938) c. 840,000. Petroleum and natural gas are produced in considerable quantities; in 1934 a concession was granted to the Anglo-Saxon Petroleum Company to prospect in North Borneo,

and operations are proceeding. Large areas have recently been taken for the cultivation of Manila hemp.

Brunei: 2,226 sq.mi.; pop. 36,561 (Malays 30,433); capital, Brunei Town; British resident, J. G. Black; ruler, H.H. Sultan Ahmed Tajudin.

North Borneo: c. 29,500 sq.mi.; pop. 302,174 (Chinese 53,000); capital, Sandakan; governor and commander-in-chief, C. R. Smith.

Sarawak: c. 50,000 sq.mi.; pop. c. 450,000 (Malays, Dyaks, etc., c. 350,000; Chinese c. 100,000); capital, Kuching; ruler, H.H. Sir Charles Vyner Brooke, G.C.M.G. (Rajah); language (official), English; religions, Mohammedan, Buddhist.

Production.—1938: *Brunei*: petroleum 707,219 metric tons; natural gas 3,195,000,000 cu.ft.; cutch (export) 1,695 metric tons; rubber 1,259 metric tons. *North Borneo* (exports): rubber 11,720 metric tons; copra 12,800 metric tons; sago flour 3,718 metric tons. *Sarawak* (exports): benzene, kerosene oil and liquid fuel \$10,988,871; rubber \$7,968,931; gold \$1,113,348; sago flour \$570,793.

Overseas Trade.—1938: *Brunei*: imports \$2,821,799; exports \$6,580,725. *North Borneo*: imports \$6,116,391; exports \$9,525,773. *Sarawak*: imports \$22,371,939; exports \$26,135,097.

Communications.—1938: roads, suitable for motor traffic: *Brunei* 102mi.; *North Borneo* 236mi.; *Sarawak* 101mi.; railways open to traffic (*North Borneo*) 125 miles.

Finance.—1938: Currency: Straits dollar (\$1=25.4d.)

	Brunei \$	North Borneo \$	Sarawak \$
Revenue	1,179,979	3,286,831	4,261,899
Expenditure	1,476,725	1,861,373	4,272,140

Dutch Borneo: Area: Western District, 56,664 sq.mi.; Southern and Eastern District, 151,621 sq.mi.; pop. total (census 1930) 2,194,533. Government: under the Governor-General of the Netherlands Indies.

Boston, seaport at the head of Massachusetts bay; capital of the State of Massachusetts, U.S. Population (1930) 781,188 (229,356 being foreign born whites): 1935 (State census) 817,713. Its metropolitan district (U.S. census), including 80 cities and towns, is fifth in population in the United States, (1930) 2,307,897; (1935) 2,385,465. City employees (less schools) numbered 13,116; salaries and wages (1938): \$20,011,952. Three school committee members (4-year term) and 22 councilmen (2-year term) were elected in November (non-partisan) to take office in January. A referendum vote approved State laws permitting the mayor to run for re-election (prohibited since 1918) and providing for a referendum on loans for capital improvements when so petitioned by 12,000 city voters. Mayor Tobin's (Dem.) four year term expires in Jan. 1942.

A rigid economy program and State aid reduced the 1939 tax rate from \$41.30 to \$39.90 per \$1,000 on an assessed valuation of \$1,524,800,000 (decline of \$35,607,500). The State has diverted part of its Highway fund to local highway purposes, undertaken the maintenance of metropolitan highways (\$500,000), and contributed toward the Sumner Tunnel deficit.

Boston maintained 293 school buildings and 6,428 employees, including 4,611 teachers. Enrolment (1939): kindergarten to ninth grade 86,895 (declining since 1933); high school 32,153, special 4,593, teachers' college 283. Expenditures (1939): \$16,486,855.68.

Boston is a leader in health conservation. Six of the 28 hospitals were tax supported. The city is trustee (1938) for 176 funds for civic betterment totalling \$14,071,970 and 19 permanent charity funds totalling \$716,670.93. The 1939 Community Fund raised by 109 institutions in the metropolitan area reached a net total of \$4,527,577.68. The overseers of the public welfare (1939) expended \$13,837,815.53. Cases for week ending December 23

were: dependent aid 14,729; dependent children 3,665; old age assistance 14,262. Welfare cases averaged 4,000 above 1938 while WPA employment fell from 25,000 in January to 18,000 in December. The Boston Housing Authority has started a program of nine housing units in various sections. (Estimated cost \$32,000,000.) The Huntington avenue subway extension employs 2,500 WPA workers. The police force numbered 2,443 officers and patrolmen. Expenditures (1938): \$6,042,355. Fire department employees (91 companies) totalled 1,607. Expenditures (1938): \$4,084,327.

Total bank resources exceeding \$3,000,000,000 and the Federal Reserve bank (first district) make Boston the financial centre of New England. Deposits of the eight largest banks (1938): \$1,147,868,000. Bank clearings (Jan.-Nov. 1939): \$10,416,000,000, a gain of 10.3%. Bank debits (Jan.-Nov. 1939): \$14,208,408,000, a gain of 11.1%.

Boston is the chief U.S. wool market and an important fishing port. Wool receipts (1938): 306,490,000 pounds. Fish landed (1938): 381,745,176lb., value \$7,623,465; (Jan.-Oct. 1939) 249,221,185lb., value \$6,664,450, an 8.6% decline by weight and a 3.6% increase by value. Total commerce of the Port of Boston (1938): 15,880,767 tons (of 2,000lb.), value \$716,683,427; imports, 1,798,064 tons; exports, 321,445 tons; (Jan.-Oct. 1939) imports gained 33.6% in value; exports gained 12.4%. Passenger traffic to foreign ports (1939) totalled 102,271.

Wholesale establishments (1935): 3,330; employees 32,334. Retail establishments (1935): 10,649; employees 60,968; sales \$439,120,000. Manufacturing establishments (1937): 2,311; capital invested \$231,685,903; employees 59,365; total wages paid \$71,363,364; value of products \$423,318,101; average weekly earnings (1938) \$23.54. Indices (average 1925-27=100) read: manufacturing employment (1938) 66.3, (Jan.-Nov. 1939) 74.9; manufacturers' payrolls (1938) 58.6, (Jan.-Nov. 1939) 65; department store sales (Jan.-Nov. 1939) 64.8, a gain of 1.7. Building permits (Jan.-Nov. 1939): \$8,155,369, a decline of 25.5%. The 1940 American Legion Convention is scheduled for Boston. The Veterans of Foreign Wars held the largest 1939 convention.

(S. J. McK.)

Botanical Gardens. The American Association of Nurserymen through a special committee headed by Robert Pyle of the Conard-Pyle Company, West Grove, Pa., issued in July 1939 a pamphlet entitled "A Directory of Botanical Gardens and Arboretums of the United States." It lists the arboretums and botanical gardens by States and gives a brief description of each including such items as date established, acreage, invested capital, annual budget, admission fees, and directors. For United States alone 155 such institutions are described.

The hurricane of the summer of 1938 brought to the Arnold Arboretum the problem of clearing away a large number of fallen trees and of replanting the areas thus denuded. Cities and towns over most of New England lost many shade trees in this storm.

New York Botanical Garden has completed a \$350,000 conservatory, providing a greenhouse each for the following exhibits: flower garden, ferns, succulents, begonias, palms, winter flower show, economic plants and cycads. The garden has also been fenced.

Brooklyn Botanic Garden has completed at a cost of \$30,000 the Dean Clay Osborne memorial, an architectural feature covering over three acres and consisting of a fountain, water basins, seats, and columns. This was made possible by a gift of Mrs. Sade Elizabeth Osborne.

The Shaw Botanical Garden, St. Louis, reports more than 275,000 visitors during the 10-month period Jan. to Oct., 1939. Director Moore also points out the great enlargement of various

units of the garden during his incumbency, beginning in 1912. There are now more than 100,000 sq.ft. of greenhouse space, 450,000 sq.ft. of outdoor gardens, 130,000 volumes in the library, and 1,100,000 specimens in the herbarium.

Europe and Asia.—During 1939 the Royal Botanical Garden, Kew, issued eight numbers, nearly 500 pages, of its *Bulletin of Miscellaneous Information* dealing largely with floras of various tropical countries, other systematic studies, and numerous notes on horticultural topics. W. Robyns of State Botanical Garden of Brussels and Samuel H. Lamb of Hawaii National Park published a preliminary ecological survey of the island of Hawaii in the *Bulletin* of the former institution.

K. W. Dammerman, Directeur des Instituts de Buitenzorg, maintains that 's Lands Plantentuin, which includes the botanical gardens at Buitenzorg, the mountain gardens at Tjibodas, the herbarium and the botanical laboratories, should devote their attention to botanical science as such and leave the technical applications to other institutions—*Ann. Jard. Bot. Buitenzorg*, Feb. 1939. (See also BOTANY; HORTICULTURE.) (W. C.)

Botany. Perhaps one can best get a picture of the activities in the field for the year 1939 by discussing the holiday program of the largest group of plant science workers in the world, the botanical groups of the American Association for the Advancement of Science (A.A.A.S.) supplemented by the mention of some outstanding contributions from elsewhere. The programs of the groups appear in the program of the A.A.A.S. December 27, 1939 to January 2, 1940, Columbus, Ohio. This will give a good idea of the scope of the subject and the problems most emphasized during 1939, but it will not give a measure of the volume of research and publications in the field during the year.

In this program we find the following societies dealing with botanical sciences entirely: Botanical Society of America, American Phytopathological Society, American Society of Plant Physiology, Mycological Society of America, American Society of Plant Taxonomy, and American Society of Horticultural Science. The latter is listed under agriculture but deals exclusively with plants and their pests. Besides these groups that are interested entirely in plants, there are other societies that cover both botany and zoology: the Ecological Society of America and Genetics Society of America. The American Society of Agronomy, not affiliated with the A.A.A.S., deals with many plant problems along with soil problems, also the American Society of Bacteriologists, likewise not affiliated with the A.A.A.S., has the lowest order of plants as its subject of study, although its interests are largely in food preservation, soils studies, medicine, etc. The examination of the organization of scientific societies of other countries or the organization of the departments of agriculture of the U.S. or other countries would likewise indicate the many fields of botanical study and show the lines of greatest activity.

An examination of the organization and programs of two societies of the A.A.A.S., Botanical Society of America and American Phytopathological Society, will indicate scope of work and more important contributions for the year.

The Botanical Society of America consists of the following sections: General section, Systematic section, Physiological section, and Palaeobotanical section.

The General section covered the following topics about plants: morphology, cytology, physiology, sexuality, evolution, production of mutants by use of X-ray, colchicine and acenaphthene, biochemical changes, and nutrient solutions. Two outstanding contributions in these programs were the production of mutants with colchicine by Blakeslee and others, and the discovery of plastids in plant cells that make cellulose particles. The latter may be the outstanding botanical contribution of the year. The Physio-

logical section covered in addition: toxic compounds and antagonism between them, synthesis of glucosides, distribution of vitamins, respiration and protoplasmic streaming, germination of spores and seeds, drought resistance, temperature as a factor in various plant processes, light quality effects, and growth substances or plant hormones. The last topic received a great amount of attention during 1939, occupying the attention of dozens of investigators in U.S.A. and the attention of many in other countries. It has also added much to the knowledge of plant processes and promises great contributions in the future.

In the Palaeobotanical section were contributions to plants of various geological strata, the evolution of plants, structure of fruiting bodies of fossil plants, and to past climatic and stratigraphic conditions. In systematics, contributions were made to local floras, relationships within various families of plants, development of nomenclatures, floras as effected by physiographic features, and variations within species.

The American Phytopathological Society covered the following general topics: defence mechanism and disease resistance, physiological reactions to disease organisms, physiological strains of disease organisms, soil deficiency diseases, bacterial diseases, effect of soil nutrients and reaction on disease, varieties of plants resistant to diseases, seed treatment for disease control, nematode injury, silver salts as fungicides, and virus diseases. A great amount of attention is now being given to virus diseases.

Other Contributions.—Another excellent source of knowledge of contributions made to botany during 1939 is an article by F. E. Denny entitled "Advances in Botany" (*News Edition, Industrial & Engineering Chem.* v. 18, No. 2, 1940). Among the discoveries cited in this review are the following: Kramer (Duke university) shows that drops of water on a leaf do not focus the sunlight within the leaf so as to injure it, but far beyond the leaf. Neff (Iowa State coll.) showed that cut carnations keep better in cold storage and last longer after removal when they are wrapped up partly wilted than when kept in cold storage with stems in water. Lochow (Germany) has found 250 alkaloid free lupine plants out of many million studied. All were white-seeded. Groner (Bucknell) found that water of guttation from *Impatiens sultani* leaves is almost pure sucrose solution. Moewus (Germany) found crocin effective in inducing the motility of *Chlamydomonas* in dilutions of one part in 250,000,000,000 of water. This is minimum concentration of a chemical known to modify plant behaviour. White (Rockefeller Inst.) has shown that plant tissue cultures on the surface of semi-fluid nutrients give no differentiation of tissues but when cultured in fluid nutrients 8mm. below the surface the tissue differentiates into stems and leaves but no roots are formed. Arnon and Stout (Univ. of Calif.) found molybdenum in extreme dilution an essential element for nutrition of tomato plants. Raleigh (Cornell university) found silicon essential for growth of the beet plant. Oat plants (Gilbert and Bradley, Wyo. Agr. Sta.) may accumulate enough potassium nitrate to make the hay fatal to animals. Evans (Pretoria, Africa) found that a single plant of a star grass may cover 8,000 sq.ft. of land due to its ramifying underground stem system. Resistance of plants of grains to heat injury (Laude, Kans. Agr. Sta.) shows a diurnal curve; lowest in early morning and highest at mid-day. New yeast hybrids for breadmaking (Winge and Laustsen, Copenhagen) have appeared. Burrell and Miller (Ohio State university) find leaves of milkweeds very high in vitamin C. Denny's article reports many other interesting and important botanical discoveries for 1939. (See also BOTANICAL GARDENS; HORTICULTURE.) (W. C.)

Boulder Dam: see DAMS; ELECTRIC TRANSMISSION AND DISTRIBUTION; WATER POWER.



JOE LOUIS GOES DOWN under a blow from Tony Galento in the third round of their heavyweight championship bout June 28, 1939, at New York city

Bowling. The game has increased in the number of players to 12,000,000, using 160,000 regulation alleys. During the 55 days that Cleveland was host to more than 23,000 bowlers in the American Bowling Congress, the scores were as follows: winner of individual title, Jim Danek, of Forest Park, Ill., with 730; doubles championship, Murray Fowler and Phil Icuss, with the winning total of 1,405; 5-man championship team, Fife Electric Supply Co. of Detroit, Mich., with a score of 3,151.

In women's bowling, the Women's International Bowling Congress champions were: Helen Hengstler, of Detroit, individual winner; 5-woman team, Kornitz Oil Co., Milwaukee, Wis.; 2-woman team, Connie Powers and Bobby Reus, Grand Rapids, Mich.; all events winner, Ruth Troy, of Dayton, Ohio.

The Intercollegiate title was won by the Syracuse university team. Barney Evans and Bill Hofner, of Rochester, N.Y. set a world's doubles mark of 1,517. (J. B. P.)

Boxing. Twenty-five title defences made 1939 a notable year in boxing. The spectacle of Joe Louis, world heavyweight champion, on the floor under a blow, provided the year's greatest thrill. Generally the sport experienced characteristic activity in all standard ring divisions save the flyweight class. Notwithstanding, the sport experienced its abuses. It was investigated in New York, Pennsylvania, Illinois, Michigan, and California. The crowds were not as enormous as in former years. The receipts records at no time were menaced. The year ended with no prospect worthy of comparison with Louis in the heavyweight class, and few, if any, in the lighter divisions.

TONY GALENTO COLLAPSES in the fourth round of his match with Joe Louis and is defeated by a technical knockout



Louis, despite his knockdown, was boxing's outstanding figure. The famed Brown Bomber stood pre-eminently as he has for the past several years, lord of all he surveys. Louis defended his heavyweight title by knocking out, in order, John Henry Lewis, Jack Roper, Tony Galento, and Bob Pastor. His scene of action extended from the Atlantic to the Pacific coast. His reign was questioned only in the struggle against Galento when the despised "Two-ton" Tony, accorded no chance at all by ring followers and critics, staggered the title-holder under a fiery fusillade in the first round, dropped Louis with a boulder-like left hook to the jaw in the third, before succumbing himself to the influence of the Louis punch in the fourth round. Louis knocked out Lewis in 2 min. 29 sec. of the first round of a bout in New York in January. He journeyed to California and there knocked out Roper in 2 min. 20 sec. of the first round in a bout held in April. The Galento battle followed, a June attraction in New York which saw "Two-ton" Tony a helpless human hulk in 2 min. 29 sec. of the fourth round, after providing boxing's biggest thrill of the year. And, in September Louis knocked out Pastor in 38 sec. of the 11th round of a bout in Detroit, the first heavyweight title match scheduled for 20 rounds in modern times and the first heavyweight championship ever waged in Detroit. Louis grossed \$283,986 for his year's labour, boosting to \$1,669,722 his ring earnings since the day back in 1934 when he discarded his labourer's overalls in the Ford plant at River Rouge to take up boxing as a profession. Only Jack Dempsey and Gene Tunney have excelled Louis in ring earnings. The champion's largest purse came from the Pastor battle, which also drew the year's largest gate receipts. Louis received \$118,400 for disposing of Pastor. The receipts amounted to \$347,870, a far cry from the million-dollar gates of another year and era, yet sufficient to provide a handsome profit for Promoter Michael Strauss Jacobs of the Twentieth Century S.C., who directed the affair as boxing's current monopolist. Louis's bout with Galento attracted receipts of \$282,303, a tremendous figure for a title match in which the challenger admittedly had scant chance entering the ring. The Lewis and Roper bouts were indoor attractions, limited in capacity, neither a sell-out.

Billy Conn, scoring two victories over Fred Apostoli and ending the light-heavyweight reign of Melio Bettina of Beacon, N.Y., gained attention as one of the outstanding performers of the year. He won the 175-pound title from Bettina in July and repeated the victory in September when Bettina challenged.

Henry Armstrong, world welterweight champion, was the year's most active champion, with 11 title defences. Naturally not all of these were against first-class challengers. Armstrong, known as "Hammering Henry" because of his tireless style, simply took on all comers on a basis of first-come-first-served. He conquered Baby Arizmendi, Bobby Pacho (twice), Lew Feldman, Davey Day, Ernie Roderick (in London, Eng.), Al Manfredo, Howard Scott, Ritchie Fontaine, and Jimmy Garrison (twice). The one upset to Armstrong's string of victories came in August when he lost to Lou Ambers, Herkimer, N.Y., and relinquished the light-weight title. The decision was roundly disputed, but it was official nevertheless and carried with it one of the three titles which at one time gained Armstrong the distinction of being the only boxer ever to hold three championships at one time. Armstrong had long since forsaken the world featherweight title.

The middleweight championship was a disputed possession. Two champions provided three bouts. Al Hostak, National Boxing Association champion, knocked out Solly Krieger early in the year and in December knocked out Eric Seelig to maintain his N.B.A. position. Ceferino Garcia, Californian, knocked out Fred Apostoli in seven of the most spectacular rounds of the year in New York, to gain recognition in New York and California as title-holder. Joey Archibald, Providence, R.I., retained the featherweight

crown, winning decisions over Leo Rodak, Chicago, and Henry Jeffra, Baltimore. Sixto Escobar, Puerto Rican, made one defence of the world bantamweight title against Kayo Morgan, in an unimpressive battle in San Juan, P.R. in April, and surrendered the title because of inability longer to make the 118-pound weight prescribed as the class maximum. This left the bantamweight championship unclaimed, a condition which also surrounded the flyweight championship in which there has been little or no action for the past several years.

Amateur Boxing.—Amateur and collegiate boxing attracted wider popularity and additional recruits. Amateur Athletic Union sectional, State, and national championships were conducted on a larger scale than ever before. In collegiate boxing West Point retained the Eastern Intercollegiate Association championships; Bucknell won the Eastern Conference title; Louisiana State captured the Southeastern Conference championship, and the University of Wisconsin, winning four individual titles, created a valid claim to a mythical team championship in the National Collegiate A. A., where no actual team title is awarded.

Abroad.—The clouds of war cast their spell over boxing in foreign countries. The sport was practically abandoned in England, France, Germany, Italy, and Spain. What activity continued was on a smaller scale than ever before in Australia where a number of American boxers of ordinary rank made tours before war broke out and made ocean travel hazardous. (J. P. D.)

Boy Scouts. During 1939 the increase in membership of the Boy Scouts of America was 66,188 for the first nine months, bringing the total up to 1,340,950. During the first nine months of the year there were 1,684,469 boys and men participating in the Scout program. Since the Boy Scouts of America was first founded in 1910 through Sept. 1939, 8,808,338 persons have been associated with it.

Outstanding events of the year were Boy Scout participation at the World's Fair Camp in New York and at the Golden Gate Exposition in San Francisco. Scouts maintained a service camp on the World's Fair grounds in which 3,258 Scouts and Leaders took part. The annual meeting of the National Council was held in part at the World's Fair grounds on Boy Scout Day. In San Francisco a Boy Scout camp was not maintained but Scouts were given an opportunity to camp nearby.

About 600,000 boys went to camp some time during the year. Scouts camp by troop and patrols and camping activities include a wide scope of outdoor experience.

Under the leadership of a strong reading program committee, of which Colonel Theodore Roosevelt is chairman, a new reading program was launched. The Seventh National Training Conference of Scout Executives, the professional leaders of the movement, was held in September at Bretton Woods, New Hampshire. Over one thousand professional Scout leaders attended.

Abroad.—During 1939 several international scouting events of importance took place. Foremost among these was the Tenth International Scout Conference which took place in Edinburgh, Scotland from July 26–28 and which, in spite of the gathering clouds on the European political horizon, was well attended, with representatives of most of the Scout Associations of the world registered with the International Bureau.

During this conference J. S. Wilson, honorary director of the International Bureau, presented the Scout membership figures of the world. Since 1937 the total active membership has risen from 2,812,074 to a new high mark of 3,305,149—an increase of 493,075—this in spite of the disbandment of the Scout Association in Austria, the reduction of effective Scouting in what was Czechoslovakia, the disaffiliation of the Boy Scouts Nationaux d'Haiti, and the formation of a Japanese National Youth Organization

which has absorbed the majority of members in the Boy Scouts of Japan (315,776 of this increase represents membership reported by China, for which country no membership appeared in the 1937 statement). Previous to this conference, the World Rover Moot was held at Monzie's Castle near Crieff, Scotland, from July 16–26. Three thousand, six hundred boys from 42 lands took part in it.

Early in the year, Jan. 1939, the Australasian Jamboree took place near Bradfield, Australia. Some 11,000 Scouts were encamped at the Jamboree, most of them from the British possessions, including 25 from England itself, one dozen from South Africa, three or four from Ceylon and India, 40 from Noumea, a dozen from Nauru, and one lone Scout from Canada. Australasia, New Zealand, Victoria, South and Western Australia, Queensland, and New South Wales were also represented.

In 1939, Dr. James E. West, chief Scout executive of the Boy Scouts of America, was elected to the International Committee during the Tenth International Scout Conference. This is a committee which handles the affairs of world scouting in the intervals between Biennial International Conferences. Its headquarters are at London. (J. E. W.)

Brady, Alice (1892–1939), U.S. actress, was born November 2 at New York city, the daughter of a Broadway producer and a Parisian singer and danseuse. She was reared in convents at New York city and Madison, N. J., then studied for an operatic career at the Boston Conservatory of Music. After singing several principal roles in Gilbert and Sullivan operettas she forsook a musical career for the legitimate stage and won her first success in 1912 as Meg in *Little Women*. Probably her most successful stage appearance was as Pennie in *Forever After*, which she played for two years (1918–20). She also starred in such silent motion pictures as *Bought and Paid For* and *The Gilded Cage*. But her greatest fame as a motion picture actress was reserved for her semi-middle-aged roles in sound pictures, such as *My Man Godfrey* (1936) and *In Old Chicago* (1938). For her portrayal of Mrs. O'Leary in the latter picture she received the 1937 Academy award as the best supporting actress. Other motion pictures in which she appeared were *Stage Mother* (1933), *Mind Your Own Business* (1936), *One Hundred Men and a Girl* (1937), *Mama Steps Out* (1937), *Joy of Living* (1938) and *Goodbye Broadway* (1938). Her last motion picture appearance was with Henry Fonda in *Young Mr. Lincoln* (1939). During this time she continued to appear on Broadway and played a leading role in *Mourning Becomes Electra* (1931). She died at New York city on October 28.

Brandy: see LIQUORS, ALCOHOLIC.

Brauchitsch, Walther Von (1881–), German general, was born in Berlin on October 4, the son of a general of cavalry, and was educated in the German capital. He entered a military academy and became a lieutenant in 1900. In 1912 he became an officer of the German general staff and he served in this position during the World War. He was appointed inspector of artillery in 1932, and the following year he succeeded Marshal von Blomberg as commander of the East Prussian army district, which in 1935 was transformed into the 1st Army corps. In 1937 he became commander of the 4th Army group, and in Feb. 1938 after the "army purge" he succeeded Gen. von Fritsch (*q.v.*) as commander-in-chief of the German Army, being promoted at the same time to the rank of colonel-general. Brauchitsch, whose decorations include the Iron Cross, first and second grades, and the House Order of the Hohenzollerns, arrived at the eastern front on the morning of September 1 to direct the German invasion of Poland.

Brazil, a republic in eastern South America and largest independent country in the Western Hemisphere; language, Portuguese; capital, Rio de Janeiro; president-dictator, Getulio Vargas.

Area and Population.—The area is 3,291,416 sq.mi., $7\frac{1}{2}\%$ greater than that of the United States. The population was officially estimated as 43,246,931 in 1937. The great bulk of the population lives on the coastal strip. The north is largely negroid, especially around Bahia, with Indian elements in the Amazon basin. Italian, Portuguese, Spanish, German, and Japanese immigration, in the order named, has been especially heavy in the southern States. The principal cities are: Rio de Janeiro, 1,871,830; São Paulo, 1,167,862; Recife (Pernambuco), 491,078; Juiz de Fora 382,857; São Salvador (Bahia), 369,692; Porto Alegre, 336,504; Belém (Pará), 298,340; Santos, 203,126; Bello Horizonte, 193,706.

History.—Politically, Brazil was quiet in 1939. Ruling by decree, President-Dictator Vargas continued his policy of nationalism and centralization, with emphasis on the development of national resources and industry and improvement of communications. Local powers were further reduced. All State flags were abolished by presidential decree in April, and an administrative department set up in each State to serve as a check upon the governor.

Internal difficulties were primarily with unassimilated immigrant groups, notably the Germans in Santa Catharina State. The president made emphatic denunciation of foreign ideologies and took steps against evaders of the 1938 decree requiring instruction in Portuguese and the teaching of Brazilian history in all schools, which had resulted in the closing of many private institutions. In 1939 over 200 children of German parentage left Brazil to study in Germany; consequently, a decree was issued forbidding children under 18 years to attend schools abroad unless accompanied by their parents. It was further required that all schools other than religious were to be directed by Brazilians. Effective Jan. 1, 1940, textbooks in all Brazilian schools are required to be in accordance with the national program. The Vargas program was supported by the Roman Catholic Church in Brazil with an order that all church services in southern Brazil be conducted in Portuguese. In July, a further decree, aimed at subversive propaganda, provided that all future periodicals published in a foreign language must include a Portuguese translation.

Encouragement of immigration was likewise used to combat the problem of unassimilated Germans in the southern States. There the governor of Santa Catharina opened his State to unlimited Portuguese and North American immigration. Special inducements to North American families to migrate to the cattle, wheat, and cotton regions of southern Brazil were held out, and in March the National Immigration Council voted gift grants of 50 to 75ac. as an encouragement.

A still further evidence of the nationalistic program was noted in the requirement made in April 1939 that all insurance companies operating in the country re-insure their policies with the Government. The eventual objective of this was the nationalization of insurance.

A second feature of the year was the inauguration of President Vargas' "Five Year Plan," an economically important program calling for the outlay of \$50,000,000 annually to develop basic industries and public works, particularly communications, and to improve national defence. Financing of the plan is to be through taxes on exchange transactions and banking profits, by the emission of treasury notes, and by gold exportation. Among the projects given immediate consideration were: development of a Brazilian iron and steel industry, exploitation of the nickel mines of Goyaz, fostering of agriculture in the São Francisco valley,

completion of the Rio de Janeiro-Bahia highway, and enlargement of the nationally-owned Lloyd Brasileiro steamship line.

Among the legal reforms effected in 1939 was a new civil code simplifying and cheapening litigation and a decree (May 1) transferring all labour questions from the regular courts to a special tribunal.

Serious drought affected especially the northern and central sections of the country early in 1939, necessitating transfer of a large part of the population of some areas to the south. Even in the south, the drought effect was such that a material reduction in the 1939-40 coffee crop was anticipated. Rio de Janeiro itself faced a water shortage in November, but timely completion of a new aqueduct relieved the situation.

Tourist traffic to Brazil was augmented during 1939. In February, President Vargas set aside the Brazilian bank of the Alto Paraná river immediately adjacent to the great Iguassú Falls (the largest in America) as the first national park. On November 10, second anniversary of the "New State" (accession of President-Dictator Vargas to absolute power in 1937), there began a nationwide series of celebrations culminating on November 15, the 50th anniversary of the founding of the Brazilian republic. A feature of the elaborate program was the visit of seven "Flying Fortresses" of the United States Army air force.

The year was marked in international relations by the continuation of cordial relations with neighbouring republics. A military mission was exchanged with Uruguay, and a trade treaty concluded with that country. In August Brazilian representatives met with those of Argentina, Paraguay, and Uruguay to discuss customs and exchange problems. Following the disastrous Chilean earthquake of January 24, aid was rushed to the stricken area by plane and by steamer. (*See CHILE.*)

Until the outbreak of the European war in Sept. 1939, Italy, Germany, and the United States carried on a vigorous rivalry for dominating positions in Brazilian trade and friendship. Italian plans to inaugurate air service from Rome to Rio de Janeiro neared completion. In May, Countess Ciano, influential daughter of Benito Mussolini, visited Brazil briefly on a good-will mission. Meanwhile, Italy was attempting to arrange a barter agreement similar to that with Germany. In June, ambassadors were exchanged by Brazil and Germany after a year of strained relations. In March a formal invitation was issued by Germany asking the Brazilian chief of staff to visit Germany and view the German war machine. This was followed by similar invitations from Italy and other European countries. A subsequent invitation from the United States was accepted, instead, however, and outbreak of European war precluded a subsequent visit to Europe. In May the United States Army chief of staff visited Brazil and spent two weeks in a tour of Brazilian military establishments. The Brazilian chief of staff then accompanied him to the United States, where he in his turn inspected military units throughout the country. The exchange was acclaimed by the press of both countries as a step toward American solidarity.

The most significant event of 1939 in Brazilian relations with the United States was the journey of Foreign Minister Oswaldo Aranha to the United States at the special invitation of President Roosevelt in February and March. The object of his visit was the strengthening of the general trade and financial relations of the two countries, which had suffered as a result of Brazil's inadequate exchange supply, unwillingness of United States exporters to concede long-term credits, and the inroads on Brazilian trade due to Germany's barter system. The defaulted Brazilian debt of \$357,000,000 (held principally in the United States) was likewise discussed. After four weeks of conversations, it was disclosed through an exchange of notes between Señor Aranha and United States Secretary of State Hull that: \$20,000,000 would be loaned

to Brazil to provide adequate exchange; the United States Export-Import Bank would finance future exports through grant of credits; the United States Congress would be asked to approve a loan of \$50,000,000 to the Central Reserve Bank of Brazil; and technical aid would be given to facilitate the development of Brazil's vast resources. Brazil on her part agreed to free exchange, to guarantee North American investors equality with Brazilians, to develop her rubber industry, and to resume service on her bonded indebtedness. The accord, acclaimed enthusiastically in both countries, was regarded as a precedent for similar agreements with other Hispanic American nations. In April a Brazilian representative went to the United States to work out the details of arrangements and to enlarge the United States market for non-competitive Brazilian products. On April 8, President Vargas liberated exchange operations after two years of Government control, and in July a payment of \$1,000,000 was made on Brazilian bonds, pending a general readjustment. Conversations on this latter were interrupted by the outbreak of war in September. In other respects the terms of the Aranha-Hull understanding were generally unfulfilled at the close of the year.

On September 6, Brazil proclaimed her neutrality in the European war. In October, President Vargas reaffirmed neutrality, declaring Brazil lacked both economic and political justification for participating in the conflict. Army officers were ordered to reserve any personal opinions. Meanwhile, the Government assumed control of food prices and forbade profiteering. No rents might be raised without prior permission of Government authority. Brazil's external communications were curtailed by the war, to the extent that shortage of coal necessitated the temporary suspension of some railway service in September. To facilitate external trade several cargo ships were purchased in the United States. The battle of Punta del Este and the subsequent flight of the German pocket battleship "Graf Spee" to Montevideo aroused considerable interest and concern in Brazil, and assurances were assertedly given Uruguay that Brazil would assist her in maintenance of her neutrality. (*See HISPANIC AMERICA AND THE EUROPEAN WAR.*)

Education and Religion.—In 1935 there were 36,661 schools with a total enrolment of 2,862,666. Progress in education has not kept up with the material progress of the country in recent years.

Army and Navy.—The Brazilian regular army numbers 80,000, and is supplemented by 30,000 State troops. Military service is compulsory. The navy, second in Hispanic America, is being rapidly expanded. Six destroyers under construction in England at the outbreak of war in Sept. 1939 were taken over by the British Government.

The navy was active late in 1939 in patrolling the Brazilian coast to protect Brazilian neutrality.

Finance.—The monetary unit is the milreis (value: approx. 5.15¢ U.S.), ordinarily expressed in contos of 1,000 milreis each for large transactions.

Trade and Communication.—Under normal conditions Brazil enjoys excellent external communication. In 1939 the nationally owned Lloyd Brasileiro line enlarged its fleet by the purchase of 10 freighters and four passenger vessels in the United States. Air transport by Pan American Airways connects Brazil with all parts of the Americas. Until Sept. 1939 German, French, and Italian transatlantic service gave connection with Europe, but the German service was suspended at the outbreak of war. Lack of adequate rail and highway facilities within the country is an outstanding weakness. Under the "Five Year Plan" \$62,500,000 is to be spent on development of communications. There are 34,321 km. of railway, which will be supplemented by railroads now in project or under construction connecting the Bolivian oil fields with the Brazilian port of Santos. Another railway, from

Asunción (Paraguay) to Santos, is in project and construction is scheduled to begin in 1940. There are 207,700 km. of highway, of which 87% is unpaved. The 1,867 km. Rio de Janeiro-Bahia highway, and a superhighway from Santos to São Paulo were under construction during 1939. Communication in the Amazon basin is almost entirely by water, supplemented by air transport. Ocean-going steamers are the chief means of communication between the northern and the southern ports.

In 1938 Brazilian foreign trade declined 12.9%. Imports and exports were almost exactly balanced at \$295,388,599 and \$295,558,058, respectively, declines of 10.9% and 14.5%. Germany led the import trade with 25.5%. The United States (25.2%), Argentina (11.8%), and Great Britain (10.4%), followed. Foodstuffs (especially wheat), manufactured goods (principally machinery, automobiles, and railway equipment), and fuel (coal, oil, and gasoline) are the most important imports.

The United States led exports in 1938 (34.3%), with Germany (19.1%), and Great Britain (8.8%) following. Coffee exports ascended to a record volume of 17,208,088 bags, a 41% increase over 1937. Cotton exports advanced 13.7% in volume, but declined 22.2% in value.

In the first eight months of 1939, exports rose 4.4% in value, while imports declined 10.2%, with the United States leading in both. British and Argentine trade with Brazil showed increases while that of Germany declined. After outbreak of war German trade practically was non-existent. The effects of European war were felt in a decline of coffee exports, and an increased demand for cotton, manganese, fats, hides and skins, frozen meats, and vegetable oils.

Agriculture and Mining.—Brazil is primarily and predominantly agricultural. The most important single crop is coffee, of which she produces approximately three-fourths of the world's supply, chiefly in the state of São Paulo. Brazilian coffee is, however, generally regarded as inferior to that of Central America and Colombia, with which it is usually blended after export. Increasing foreign competition and the now abandoned policy of rigid crop control have seriously handicapped the industry. Coffee exports in 1933 aggregated nearly 75% of all exports, but by 1937 the total had fallen to 42.06%. The 1939-40 crop was estimated at 21,861,000 bags. Cotton, second among exports, continued its sensational rise during the first nine months of 1939, with exports approaching the 300,000 metric ton mark, a 50% advance over 1938. Brazil is the world's fifth heaviest producer of cotton, and is second only to the United States in the production of maize, whose crop value approaches that of coffee and cotton. Domestic demand takes practically the entire maize crop. Cacao is also of high importance, and Brazil is second only to the Gold Coast of Africa in its production. Other important agricultural products and the estimated value of their 1937 production are: rice, 703,000 contos; sugar, 664,000 contos; oranges, 351,000 contos; beans, 338,000 contos; manioc flour, 317,000 contos. Mate, or Paraguay tea (called Brazilian tea in Brazil) is also produced on a large scale, although Argentina, once Brazil's best customer, now grows practically all of her own needs. Cultivation of wheat, which constitutes 15% of all imports into Brazil, is being encouraged by the Government. A large export trade in castanha, or Brazil, nuts from the Amazon valley exists. There, too, are produced considerable quantities of vegetable oils and of carnauba wax. Production of carnauba wax, primarily for export to the United States, rose to 15,000 metric tons in 1937, a 92% increase over the average production from 1925 to 1935. The States of Pará and Amazonas possess an estimated 5,000,000,000 board feet of hardwood timber. The estimated value of Brazilian forest production in 1937 was 609,000 contos.

The livestock industry is important, especially in Minas Geraes, Rio Grande do Sul, and Bahia States, and in addition to taking care of domestic needs accounts for almost 10% of all exports. Brazil ranks third in the world in swine-breeding, fourth in oxen, fourth in horses, and ninth in sheep.

An estimated 40% of the world's iron deposits are in Brazil, but lack of coal and inadequacy of transportation have hindered development. Until 1939 there was practically no petroleum field of importance known to exist in Brazil, and the country was obliged to import all of its needs. To make available a ready supply, an arrangement was made with Bolivia in 1938 under which a railroad tapping the Bolivian oil fields would be jointly constructed by the two countries. Oil of good quality but as yet uncertain extent was discovered in Bahia State in Jan. 1939. Land within a 100km. radius was set aside as a Government preserve, and machinery and technical assistance brought from the United States. To reduce heavy gasoline imports, the construction of three refineries at Nictheroy (across the bay from Rio de Janeiro) at a cost of \$2,500,000 is planned. Other undeveloped mineral resources of Brazil include manganese, gold, and nickel.

Manufacturing.—Although in no sense adequate for domestic needs, manufacturing is being encouraged by the Government and its development is one of the cardinal points of the "Five Year Plan." A third of all Brazilian manufacturing activity is carried on within the State of São Paulo. During 1938 and 1939, efforts were made to locate steel mills at Nictheroy. The proposed mills would utilize Brazilian iron resources, but lack of capital, of adequate fuel supply, and of sufficient transportation facilities precluded the project from being brought to a final stage in 1939.

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Bread and Bakery Products. Improvements in the standard methods of bread making have included the greater use of mechanical equipment and the adoption of formulas that produce more nourishing and satisfactory loaves. Mechanical ovens have been rapidly displacing the older peel ovens. There has been a considerable increase in the use of dry milk solids containing less than 1½% fat, particularly by bakers in the United States. The incorporation of milk solids in bread, together with the use of dough conditioners comprised of calcium salts, has greatly increased the calcium content of modern white bread. Some bakers are also augmenting the vitamin B₁ content of white bread by means of special yeast, or in other ways. Both the sponge and straight dough processes continue to be employed for bread-making, at least in the U.S., although there is a tendency toward greater adoption of the straight dough method in Great Britain. (J. A. To.)

The latest available figures in 1939 for the baking industry were contained in the 1937 biennial census of manufactures. In the latter year there were 17,193 baking establishments in the United States with 239,388 wage earners. The total cost of supplies was \$727,021,811 and the wages paid were \$293,994,425. Value of product manufactured was \$1,426,162,859, of which \$796,708,801 represented bread and other yeast-raised products. In 1939 the number of retail outlets was estimated as 350,000, and approximately 100,000 motor vehicles were employed in the distribution of bread and bakery products.

Breguet, Jacques Eugene (1881–1939), French aero-plane designer and manufacturer, was born in Paris on April 23, the great-grandson of Abraham Breguet, famous French watchmaker. He and his brother Louis entered the Breguet establishment as youths and expanded its business to include the manufacture of electrical and

mechanical equipment. Louis, with the assistance of Jacques, designed the first practical helicopter in 1909. At the outbreak of the World War (1914–18), Jacques Breguet served for six months in the front-line trenches before he was recalled by the French Gov't to manufacture military planes. After the war he founded the Maison Breguet near Paris, a factory which produced some of the nation's best known civil and military aircraft, including the plane in which Costes and Bellonte flew from Paris to New York in 1930. Breguet died in Paris on March 21.

"Bremen": see EUROPEAN WAR: *The War at Sea*.

Brewing and Beer. Sales of fermented malt beverages by breweries in the United States in the 1939 calendar year were 2.7% greater than in 1938 but less than in the peak post-prohibition year of 1937. The following figures show sales of fermented malt beverages in the United States by calendar years since the relegalization of beer on April 7, 1933, in barrels (31 U.S. gals.): 1933 (nine months), 20,469,370; 1934, 39,860,979; 1935, 44,907,715; 1936, 52,942,739; 1937, 55,614,614; 1938, 51,360,340; 1939, 52,723,082.

There is one predominant reason for beer sales in the post-prohibition era being less than in the pre-prohibition era: the tremendous increase in excise tax rates. Prior to prohibition the Federal tax on beer was \$1 per barrel and no States imposed a tax. In 1939 the Federal tax was \$5 per barrel and every State in the Union imposed additional taxes ranging from 50¢ to \$6.62 per barrel. It will be seen, therefore, that beer sales in 1939 were only 6.3% less than in the peak pre-prohibition year of 1913 although tax rates on the product were from 450% to 1,062% higher. However, due to the increase in population from 1913 to 1939 there was a greater difference in per capita beer consumption than indicated by the difference in total sales. Per capita consumption for the two years was as follows: 1913, 22.6 gallons; 1939, 13.3 gallons. In 1939 the breweries of 13 States accounted for 88% of the nation's total sales, five other States accounted for an additional 7.1%, while 25 other States and territories (including Alaska, Hawaii, and District of Columbia) accounted for only 4.9%. No breweries were operated in eight States.

Beer production in the United States is likewise being gradually concentrated in fewer breweries. In the final month of 1939 there were 585 breweries in operation, compared with 627 at the end of 1938 and 667 at the end of 1937. In the peak pre-prohibition year there were 1,413 breweries operated in the United States.

The volume and percentage of beer sold in bottles and cans has increased consistently in the last few years. In 1939, 49.3% of total beer sales was in bottles and cans, compared with 46.2% in 1938, 43.9% in 1937, 38.2% in 1936, 29.5% in 1935, and 25.2% in 1934. This indicates more beer is being consumed in the home.

World Production and Consumption.—World-wide production and consumption of fermented malt beverages, which—due to the World War (1914–18) and prohibition—suffered a sharp drop from approximately 285,000,000 hectolitres in 1913 to approximately 125,000,000 hectolitres in 1920, has shown consistent improvement in more recent years. World beer production of fermented malt beverages for 1933 to 1938, calculated for international purposes in hectolitres (a hectolitre is equal to 26.418 gals.) was 1933, 146,500,000; 1934, 184,300,000; 1935, 197,800,000; 1936, 209,200,000; 1937, 228,000,000; 1938, 230,000,000. The United States, Germany and the United Kingdom—in the order named—were in 1938 the leading producers and consumers of fermented malt beverages, this same rank prevailing in 1913. These three nations combined accounted for approximately 66% of total world beer production in 1938 and approximately 71% in 1913. (J. Du.)

Brick. The revival of the building industry is increasing the demand for all types of building materials to such an extent that brick production in the United States has more

Brick Production in the United States
(In millions)

Type of Brick	1934	1935	1936	1937
Common	1,098.7	1,811.3	2,966.5	3,252.6
Face	305.3	472.6	848.8	937.6
Hollow	6.1	9.1	8.4	5.3
Salt-glazed	?	?	48.6	51.0
Vitrified	113.8	76.9	88.9	90.2
Sand-lime	41.4	61.8	103.2	138.3
Fireclay	395.9	494.9	626.6	728.4
Silica	103.5	149.6	229.3	220.1
Magnesite and Chromite	10.6	12.1	20.4	22.8

than trebled since 1934; preliminary reports indicate a decrease of about 10% in 1938 and a recovery in 1939 to above the 1937 level.

Production in Canada is chiefly common and face brick, with only small amounts of other types, and is mainly from imported clays; total production was 102,670,000 in 1934 and 150,275,000 in 1938, as compared with 463,923,000 in 1929.

(G. A. Ro.)

Bridge, Contract: see CONTRACT BRIDGE.

Bridge, James Howard (1856-1939), American author, was born in Manchester, England on May 8, and was educated at the Grand Lycée in Marseilles. He went to the United States in 1884, where he was editor of the *Overland Monthly* (1896-1900) and *Commerce and Industry* (1902-03). From 1914 to 1928 he was curator of the Frick art collection. He also invented and patented a system of water purification by electricity. Among his works are *A Fortnight in Heaven* (1886), *Uncle Sam at Home* (1888), *Millionaires and Grub Street* (1931) and several volumes on the treatment of water supplies.

He died May 28 in New York city.

Bridges. Since the completion of the Brooklyn bridge in 1883, the successive record span lengths achieved by bridge engineers have been:

Year	Bridge	Location	Type	Span
1937	Golden Gate	San Francisco	Suspension	4,200ft.
1932	George Washington	New York	Suspension	3,500
1929	Ambassador	Detroit	Suspension	1,850
1917	Quebec	Canada	Cantilever	1,800
1889	Forth	Scotland	Cantilever	1,700
1883	Brooklyn	New York	Suspension	1,595½

The Tacoma Narrows bridge at Puget Sound, under construction 1938 to 1940 by the State of Washington Toll Bridge Authority at a cost of \$6,000,000, is a suspension toll bridge of 2,800ft. span, the third longest span in the world.

The Bronx-Whitestone bridge spanning Long Island Sound, costing \$18,000,000 and opened April 29, 1939, in time for the New York World's Fair, is a suspension toll bridge of 2,300ft. main span, the fifth longest span in the world. (The Transbay bridge at San Francisco, completed in 1936, has two suspension spans of 2,310 feet.)

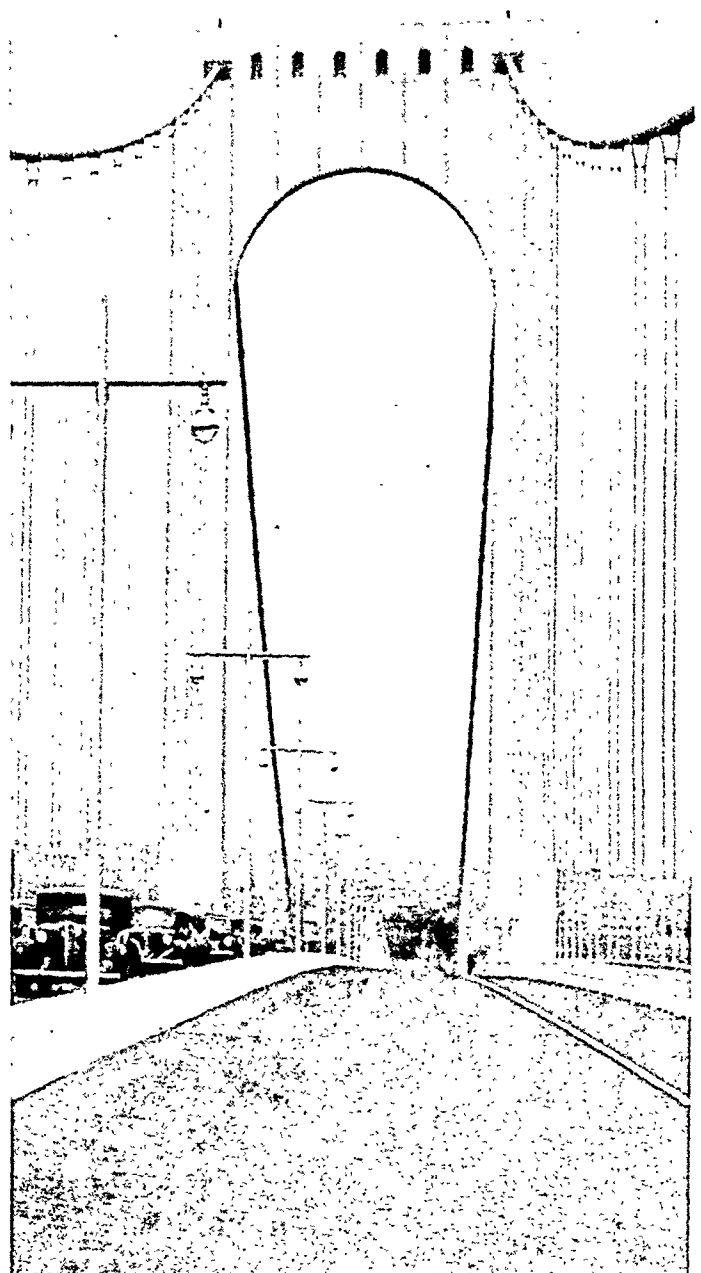
The construction of the "Tor der Welt" over the Elbe at Hamburg, to involve 500,000 tons of steel and to include a 2,296ft. suspension span and an 854ft. plate girder span, was suspended at the outbreak of the war in 1939.

The largest suspension bridge in the British Empire is the First Narrows bridge at Vancouver, B.C., opened to traffic Nov. 1938, and fully completed May 1939. It has a main span of 1,550ft., and cost \$6,000,000. This is a toll bridge, financed with British capital.

The Deer Isle bridge on the coast of Maine, opened June 1939, is a suspension toll bridge of 1,080ft. span. A difficult deep-water foundation problem was solved by lowering completely assembled sheet-pile cofferdams pre-fabricated to fit the rock contours.

The Beit bridge over the Zambezi river at Churundu, Southern Rhodesia, a suspension bridge of 1,050ft. span, was completed in May 1939.

In Vienna, the "Reichsbrücke," a new eyebar suspension bridge of 792ft.



THE BRONX-WHITESTONE BRIDGE in New York city, fifth longest suspension bridge in the world, was opened to traffic April 29, 1939

span, was completed over the Danube.

The historic Menai Suspension bridge in Wales, 580ft. span, built by Telford in 1826, was reconstructed (1939) at a cost of £200,000. A wider roadway for modern traffic was provided with the replacement of the four old wrought iron chains by two chains of high-tensile steel eyebars.

The Sullivan-Hutsonville bridge over the Wabash river, between Indiana and Illinois, completed 1939, is the fifth self-anchored suspension bridge in the U.S. The main span is 350ft., and each cable consists of nine 1½-in. galvanized rope strands arranged in open formation.

The Howrah bridge over the Hooghly river, India, under construction 1938 to 1940, is a cantilever bridge costing £1,750,000.

The Story bridge over the Brisbane river, Queensland, under construction 1935 to 1940 at a cost of £1,600,000, with a cantilever span of 924ft., is a Government-owned toll bridge and the second longest bridge in Australia.

Four new bridges over the Mississippi river, under construction 1939 to 1940, are: at Baton Rouge, La., (cantilever—\$8,500,000—848-ft. span); at Natchez, Miss., (cantilever—\$3,000,000—two 875-ft. spans); at Greenville, Miss., (cantilever—\$4,450,000—840-ft. span); and at Rock Island, Ill., (\$2,500,000—five tied-arch steel spans, two at 539 feet.). All but the last are toll bridges.

The first bridge of the Wichert continuous type was the Pittsburgh-Homestead bridge over the Monongahela river, completed 1937, of 10 arched truss spans including two spans of 533½ feet. Since then seven more Wichert type bridges have been built (1938 to 1940) including one over the Susquehanna river at Havre de Grace, Md., 7,618ft. long, with 36 Wichert truss and girder spans (longest truss spans 456ft.); and one over the Potomac river at Dahlgren, Va., two miles long, including an 800ft.

cantilever span and 25 Wichert spans (longest truss span 350ft., longest girder span 162 feet).

Near Paris, a highway bridge with a record-breaking concrete girder span of 256ft. has been built over the Seine at Villeneuve.

The Raritan river bridge at Perth Amboy, N.J., under construction 1939 to 1940 at a cost of \$4,000,000, is of continuous plate girder construction, including 8 spans of 200ft. and one span of 250 feet. Also under construction 1939 to 1940, one of the approaches to the new Main Avenue bridge in Cleveland has a steel girder span of 271ft. (the longest plate girder span in the U.S.).

A concrete pontoon bridge across Lake Washington in Seattle, under construction 1938 to 1940 by the State of Washington Toll Bridge Authority at a total cost of \$8,850,000, has the pontoon portion 6,560ft. long made up of 24 precast cellular reinforced concrete pontoons, 117 to 378ft. long, 59ft. wide and 14½ft. deep, floating seven feet out of water, with a central 200-ft. opening for ships, provided by a sliding indrawn floating span. A second concrete pontoon bridge is under construction at Hobart, Tasmania.

At Istanbul, Turkey, the Golden Horn is now spanned by a steel pontoon bridge 1,500ft. long. The 24 pontoons, of steel box construction, 82ft. wide, 30ft. long and 12ft. deep, spaced 30ft. apart, support a rigid-frame steel superstructure carrying the concrete deck 52ft. wide. A centre section of four pontoons, moved by tugs, swings open like a gate for passage of vessels.

The Sando bridge over the Angerman river, Sweden, which was to be the world's longest concrete arch span (866ft.), collapsed Aug. 31, 1939, with the loss of 18 lives, due to failure of the falsework centring during pouring of the concrete.

The present list of the world's longest spans is as follows:

Type	Bridge	Location	Date	Span
Suspension (Cable)	Golden Gate	San Francisco	1937	4,200ft.
" "	George Washington	New York	1932	3,500
" "	Narrows	Tacoma	1940	2,800
" "	Transbay	California	1936	2,310
" "	Whitestone	New York	1939	2,300
" "	Ambassador	Detroit	1929	1,850
" "	Delaware River	Philadelphia	1926	1,750
Suspension (Eyebars)	Florianopolis	Brazil	1926	1,114
" "	Elizabeth	Budapest	1903	951
Cantilever	Quebec	Canada	1917	1,800
" "	Forth	Scotland	1889	1,700
" "	Transbay	California	1936	1,400
" "	Longview	Columbia River	1927	1,200
" "	Queensboro	New York	1909	1,182
" "	Carquinez Strait	California	1927	1,100
" "	Montreal Harbour	Quebec	1929	1,097
Steel Arch	Kill Van Kull	New York	1931	1,652
" "	Sydney Harbour	Australia	1931	1,650
" "	Hell Gate	New York	1916	977½
" "	Henry Hudson	New York	1936	800
Continuous Truss	Duisburg	Germany	1935	839
" "	Sciotoville	Ohio River	1917	775
" "	Goering	Neuwied, Germany	1935	700
" "	Chain of Rocks	Mississippi River	1929	699
" "	Cincinnati	Ohio River	1928	675
Wichert Truss	Homestead	Pittsburgh	1937	533½
Continuous Girder	Mangfall	Darching, Germany	1935	354
Simple Truss	Metropolis	Ohio River	1916	720
" "	Paducah	Ohio River	1929	716
Concrete Arch	Plougastel	Brest, France	1929	612
" "	Stockholm	Sweden	1935	593
" "	La Roche-Guyon	France	1937	528
" "	Westinghouse	Pittsburgh	1931	460
Vertical Lift	Cape Cod Canal	Massachusetts	1935	544
" "	Marine Parkway	New York	1937	540
" "	Burlington	New Jersey	1930	534
Swing Span	Fort Madison	Mississippi River	1927	525
" "	Portland	Oregon	1908	521
" "	Omaha	Nebraska	1893	520
Bascule	Sault Ste. Marie	Michigan	1914	336
" "	Chattanooga	Tennessee	1917	310
Masonry Arch	Plauen	Saxony	1905	295
" "	Salcano	Austria	1906	279

(D. B. S.)

Briquettes, Fuel: see FUEL BRIQUETTES.

Bristol, Mark Lambert (1868–1939), U.S. rear admiral, was born at Glassboro, N.J., on April 17. He graduated from the U.S. Naval academy in 1887. Appointed ensign two years later, he rose through the ranks to rear admiral in 1918. During the Spanish-American war he was stationed aboard the U.S.S. "Texas" and saw active service at the battle of Santiago and other engagements. When the United States entered the World War he first commanded a convoy warship, then was placed in command of the "Oklahoma," battleship division 6, in European waters. In Oct. 1918, he was appointed commander of the U.S. naval base at Plymouth. After the war he was sent to

Constantinople as U.S. High Commissioner to Turkey, where he successfully guarded the interests of the Allies and won the friendship of the rising Nationalist party and its leader, Mustafa Kemal Pasha. His skill in diplomacy during his tenure as high commissioner from 1919 to 1927 brought him a special citation from Sec'y of State Hughes. From 1927 until 1929 he was commander-in-chief of the U.S. Asiatic fleet, with the rank of admiral. He retired in 1932 and died at Washington, D.C., on May 13.

British Borneo: see BORNEO.

British Columbia, the western Province of the Dominion of Canada, covers an area of 366,255 sq.mi., being equivalent in size to the United Kingdom, France, Holland, Belgium, and Denmark combined. The population of the Province (1938) is approximately 761,000. About 50% of the population is concentrated in the south-western part of the Province, mainly in the cities of Vancouver, Victoria, and New Westminster. Of this population about 47,900 are orientals, 26,300 being Japanese and 21,600 being Chinese. About 90% of the Japanese and 60% of the Chinese in Canada reside in this province.

History.—Prominent events occurring in this most westerly Canadian Province during the early months of the year included: the opening of a Provincial exhibit at the Golden Gate International Exposition at San Francisco; the appointment of two Provincial representatives to the Canadian section of the International Commission studying the proposed British Columbia-Alaska Highway; and the official opening of the new Vancouver hotel in Vancouver under the joint management of the Canadian National and Canadian Pacific railways in May. The most colourful and arresting event of the year came in June, when His Gracious Majesty, King George VI, and His Gracious Consort, Queen Elizabeth, visited the Province in the course of their nation-wide tour.

Marketing methods of certain wholesale fruit agencies, charged with malpractices by Okanagan fruit growers, were investigated by Dominion Combines Commissioner F. A. McGregor during the summer months. In December, Provincial Attorney-General G. S. Wismer announced legal proceedings would be instituted against several firms named in the commissioner's report. In August, leading oil companies obtained an injunction restraining the Provincial Coal and Petroleum Commission from enforcing an order imposing a three-cent cut in the wholesale price of gasoline. At the close of 1939, the case—which has attracted Dominion-wide attention—was still before the Supreme Court of Canada.

Soon after the outbreak of hostilities in September, Premier T. D. Pattullo informed the Dominion Government that British Columbia would extend full co-operation in advancing war measures. Presenting his budget to the Legislative Assembly in December, Finance Minister Hon. John Hart stated that the national income should be reserved as much as possible for the prosecution of the war and, accordingly, no new provincial tax measures were to be introduced, nor would the Provincial Government challenge the Federal incursions into tax fields considered a Provincial domain at this time. While rejecting a plea that the Province should absorb the whole cost of education, the Finance Minister promised a comprehensive study of municipal finances after the recommendation of the Rowell Commission on Dominion-Provincial Relations had been made known. Estimating that Provincial revenues would reach \$29,300,141, and ordinary expenditures \$29,268,799, compared with an estimated revenue of \$28,820,641 and expenditure of \$28,765,457 in the preceding year, Mr. Hart forecast a revenue surplus of \$31,350 in the fiscal year ending March 31, 1941. Favourable geological reports from the Peace river area prompted the Provincial Government to ask for an appropriation to enable oil-drilling operations to be carried on in 1940. Other

measures passed by the legislature included: several statutes safeguarding property rights and other privileges for persons serving in His Majesty's forces; provision for the regulation of motor carriers and their tariffs by the Public Utilities Commission; the appointment of Justice D. A. MacDonald as commissioner to investigate Doukhobor lands, under mortgage foreclosure action, acquired by the Provincial Government.

In December, Hon. C. S. Leary succeeded Hon. Frank McPherson as Provincial Minister of Public Works; and western representation on the Dominion War Supply Board came with the appointment of W. C. Woodward, Vancouver merchant.

Industries.—Lumber shipments to the United Kingdom surpassed all previous records in 1939, in spite of shipping difficulties which followed upon the outbreak of hostilities. All basic industries, according to preliminary estimates, registered gains over the preceding year. The gross value of production amounted to \$50,500,000 in agriculture (1938, \$47,782,012); \$18,725,000 in fisheries (1938, \$18,725,591); \$75,000,000 in forestry (1938, \$67,122,000); and \$64,939,000 in mining (1938, \$64,485,551).

(G. N. P.)

British East Africa. Under this heading are grouped British colonial territories on the east coast of Africa, of which certain essential statistics are given in the table below. See BRITISH EMPIRE for population, capital towns, status, and governors. (See also separate heading, RHODESIA.)

History.—Kenya, Nyasaland, Uganda and Tanganyika territory. Earlier events in East Africa have been overshadowed by the outbreak of war. The neutrality of other colonial powers indicates that East Africa's role will be in the economic field.

The governor of Nyasaland was appointed liaison officer to the East African Command at Nairobi. In Tanganyika Nazi elements among the Germans (who number about one-third of the European population) were active before the outbreak of war. The internment of Nazi men was carried out without incident. Women and children were allowed to remain free and many Germans left the country.

British Somaliland. The wealth of British Somaliland is in its

stock, and, in spite of schemes for water development and conservation and for the improvement of stock and of pastures, already in progress, the severe drought early in 1939 did considerable damage, the losses in cattle being estimated at not less than 50%, though goats, sheep and camels suffered less. Government relief measures were introduced. Agriculture also suffered and many cultivators were compelled to eat the seed grain required for next season's sowing.

Zanzibar Protectorate. The outbreak of war found the Zanzibar Protectorate well prepared to increase self-sufficiency in food-stuffs. Extensive work had already been done by the experimental station in search of suitable crops for local planting, and the failure of the 1938 clove crop had given the Government an opportunity to encourage food planting, large quantities of maize, rice and bean-seeds being issued free to producers. Attention is also being paid to the improvement of the quality of stock and poultry. Owing to growing competition in the clove industry, new export crops must be found; and the development of the castor-oil plant and of pineapple canning is under review.

Mauritius. The drought of 1938-39 in Mauritius caused a fall of over 75,000 tons in the colony's sugar crop and a loss in wealth of more than £750,000. Concentration on sugar production has had grave economic consequences; for the prosperity of the colony depends on world sugar prices, the cultivation of the crop does not provide work throughout the year, and 90% of food and other requirements have to be imported. Labour unrest at the beginning of 1939, which led to the suppression of the Mauritius Labour Party, was quieted when the Government took steps to ameliorate conditions generally.

Seychelles. Early in 1939 the Seychelles Government purchased about 4,000 acres of land on Mahé (almost a fifth of the mainland). These estates offer a field of investment for the colony's surplus funds, give the Government direct control over the afforestation of mountain reserves, and provide the basis for a scheme of land settlement; in war-time they give opportunity for the planting of essential food crops for local consumption. Road development, the entomological control of coco-nut pests, and the completion of a central distillery for the processing of essential oil crops were fortunately well advanced before the war broke out.

British East Africa

Territory and Area in sq.mi.	Principal Products 1938 (in metric tons)	Imports and Exports 1938 (in thousand £)	Road, Rail and Shipping 1938	Revenue and Expenditure 1938 (in thousand £)	Education: Elementary and Secondary 1938
KENYA 224,960	maize, 82,400; coffee, 17,000	imp. 9,039* exp. 10,749*	(Dec. 1937) rds. arterial, 3,160mi.; rlys. 1,290mi.; shpg. cleared 2,158,767 net tons	rev. 3,776; exp. 3,649	(Dec. 1937) Europ.: schls., 35, schls., 2,091; African: schls., 52, schls., 4,593; Indian schls., 7,635; mission schls. 100
MAURITIUS 720 (dependencies, 89)	sugar, 321,373; copra, 1,482	imp. Rs. 33,830 exp. Rs. 38,928	rds. 700mi.; rly. 141mi.	(est. 1939-1940) rev. Rs. 17,330 exp. Rs. 17,324	schls., 126; schls., 39,952
NYASALAND 47,949	tobacco, 6,109 tea, 4,640	imp. 794.0 exp. 974.7	(1937) rds. main, 1,832mi.; rly. 289mi.	rev. 842; exp. 811	(1937) elem.: Europ.: schls., 4, schls., 91; African: schls., 4,112, schls., 196,325
SEYCHELLES 156	export: copra, 4,755; cinnamon leaf, value, Rs. 179,206	imp. Rs. 1,137; exp. Rs. 944	46mi. of 1st class cart rd.	(est. 1939) rev. Rs. 818; exp. Rs. 784	elem. schls., 26; schls., 3,008
BRITISH SOMALILAND 68,000	export: gums and resins, 594; skins, number, 1,699,883	imp. 728; exp. 207	rds. for wheeled traffic, c. 2,000 mi.	rev. 236; exp. 227	elem.: Govt. schls., 2; schls., 121; private- aided schls., 14; schls., 514
TANGANYIKA 360,000	exp.: coffee, 15,000; cotton, 8,600	imp. 3,537; exp. 3,708	rds. 2,783mi.; rly. 1,377mi.; shpg. cleared 3,077,951 net tons	(est. 1939) rev. 2,162; exp. 2,436	elem.: Europ.: schls., 19; schls., 934; Indian: schls., 67, schls., 5,128; African: schls., 1,014, schls., 76,360
UGANDA 93,951	coffee, 14,232; cotton, 72,541	imp. 2,993; exp. 4,669	rds. 7,488mi.; rly. 332mi.	rev. 1,864; exp. 2,020	elem.: schls., 300, schls., 34,252; sec.: schls., 22, schls., 1,250
ZANZIBAR (640) and PEMBA (180)	cloves, 7,085; copra, 11,886	imp. 994; exp. 663	rds. (Z.) 175mi.; (P.) 73mi.	rev. 465; exp. 464	elem.: schls., (Govt. schls.) 2,428, (private schls.) 2,930

*Including Uganda.

British Empire. The Governments of the British Empire and the Governors and Premiers are as follows:

Country	Area Sq. miles (approx.)	Popula- tion* (ooo's omitted)	Capital	Status	Governors and Premiers
<i>Europe</i>					
Great Britain and Northern Ire- land	93,991	47,387	London	Kingdom	George VI, King-Emperor. <i>Prime Minister</i> of Great Britain: Neville Chamberlain. Governor of Northern Ireland: The Duke of Abercorn. <i>Prime Minister</i> of Northern Ireland: Viscount Craigavon.
Channel Islands	75	96	(St. Helier St. Peter Port	Kingdom of Great Britain and N. Ireland	<i>Jersey</i> : Maj.-Gen. J. M. R. Harrison. <i>Guernsey</i> : Maj.-Gen. A. P. D. Telfer-Smollett.
Eire	26,601	2,941	Dublin	Dominion	<i>President</i> : Dr. Douglas Hyde. <i>Prime Minister</i> : Eamon de Valera.
Gibraltar	2	20	Gibraltar	Colony	Lt.-Gen. Sir Clive Liddell.
Isle of Man	227	49	Douglas	Kingdom of Great Britain and N. Ireland	Vice-Adm. Lord Granville.
Malta	122	265	Valletta	Colony	Gen. Sir C. Bonham Carter.
<i>Asia</i>					
Aden, Perim, etc.	80	65	Aden	Colony	Lt.-Col. Sir B. R. Reilly. Ruler: H. H. Shaikh Sir Hamad bin 'Isa al Khalifah.
Aden Protectorate	112,000	600	. . . . .	Protectorate	
Bahrein Islands	213	120	Manama	Protectorate	
Borneo:					
State of North Borneo	29,500	299	Sandakan	Protectorate	C. R. Smith, Gov.
Brunei	2,226	36	Brunei	Protectorate	T. F. Carey (Brit. Res.)
Sarawak	50,000	600	Kuching	Protectorate	Rajah: H. H. Sir Charles Vyner Brooke.
Burma	201,000	15,797	Rangoon	Member of the British Common- wealth of Nations	Sir A. D. Cochrane.
Ceylon	25,332	5,780	Colombo	Colony	Sir A. Caldecott.
Cyprus	3,572	373	Nicosia	Colony	W. D. Battershill.
Hongkong	391	1,010	Victoria	Colony	Sir G. A. S. Northcote, Gov.
Indian Empire	1,575,185	362,000	Delhi	Member of the British Common- wealth of Nations	Emperor of India: H.I.M. George VI. <i>Secretary of State</i> : Marquess of Zet- land. <i>Viceroy and Governor-General</i> : Mar- quess of Linlithgow.
Malaya:					
The Straits Settlements	1,357	1,311	Singapore	Colony	Sir T. S. W. Thomas, Gov.
Federated Malay States	27,700	2,053	. . . . .	Protectorates	The Rulers of Perak, Selangor, Negri Sembilan, and Pahang.
Unfederated Malay States	24,347	1,795	. . . . .	Protectorates	The Rulers of Johore, Kedah, Perlis, Kelantan, Brunei, and Trengganu.
Palestine	10,100	1,400	Jerusalem	Mandated territory	Sir H. A. MacMichael, High Commissioner
Trans-Jordan	34,740	300	Amman	Mandated territory	Emir H. H. Abdullah ibn Hussein.
<i>Africa</i>					
Kenya Colony and Protectorate	224,960	3,334	Nairobi	Colony and protectorate	Sir Henry Monck-Mason Moore.
Uganda Protectorate	93,981	3,711	Entebbe	Protectorate	Sir P. Euen Mitchell.
Zanzibar	1,020	243	Zanzibar	Colony and protectorate	J. H. Hall (Brit. Res.).
Mauritius	809	413	Port Louis	Colony	Sir Bede Clifford.
Nyasaland	47,949	1,639	Blantyre	Protectorate	Sir Donald Mackenzie-Kennedy.
St. Helena and Ascension	81	4	Jamestown	Colony	Henry Guy Pilling.
Seychelles	156	31	Victoria	Colony	Sir A. F. Grimble.
Somaliland Protectorate	68,000	350	Berbera	Protectorate	V. G. Glenday.
Basutoland Protectorate	11,716	570	Maseru	Colony	Sir Edward Harding.
Bechuanaland Protectorate	275,000	270	Mafeking, in Cape Province	Protectorate	Sir Edward Harding.
Southern Rhodesia	150,333	1,320	Salisbury	Self-governing colony	Sir H. J. Stanley.
Northern Rhodesia	290,323	1,400	Lusaka	Colony	<i>Prime Minister</i> : Hon. G. M. Huggins.
Swaziland	6,705	160	Mbabane	Protectorate	Sir J. A. Maybin.
Union of South Africa	472,550	9,889	Seat of Government, Pretoria Seat of legislature, Capetown	Dominion	Sir P. Duncan. <i>Premier</i> : General J. C. Smuts.
South-West Africa	317,725	365	Windhoek	Mandated territory	Dr. D. G. Conradie, Administrator.
Nigeria, including British Cam- eroons	372,599	19,646	Lagos	Colony and protectorate (mandated territory)	Sir B. H. Bourdillon.
Gambia	4,069	200	Bathurst	Colony	Sir W. T. Southorn.
Gold Coast, including British Togoland	91,843	3,387	Accra	Colony and protectorate	Sir A. W. Hodson.
Sierra Leone and Protectorate	27,915	1,950	Freetown	Colony and protectorate	Sir D. J. Jardine.
Anglo-Egyptian Sudan	967,500	6,187	Khartoum	Condominium	Lt.-Col. Sir G. S. Symes.
Tanganyika Territory	360,000	5,220	Dar-es-Salaam	Mandated territory	Sir M. A. Young.
<i>America</i>					
Bahamas	4,375	67	Nassau	Colony	Sir C. C. F. Dundas.
Barbados	166	191	Bridgetown	Colony	E. J. Waddington.
Bermudas	19	31	Hamilton	Colony	Maj.-Gen. D. J. C. K. Bernard.
British Guiana	80,500	337	Georgetown	Colony	Sir W. E. F. Jackson.
British Honduras	8,508	57	Belize	Colony	John A. Hunter.
Canada	3,729,665	11,105	Ottawa	Dominion	Lord Tweedsmuir,† <i>Premier</i> : W. L. Mackenzie King.

*Estimates, Dec. 31, 1937. †Died Feb. 11, 1940.

Country	Area Sq. miles (approx.)	Popula- tion* (000's omitted)	Capital	Status	Governors and Premiers
<i>America (Continued)</i>					
Falkland Islands and Depend- encies	4,618	3	Port Stanley	Colony	Sir H. Henniker-Heaton. Sir A. F. Richards. Sir G. J. Lethem.
Jamaica and Dependencies . .	4,710	1,165	Kingston	Colony	
Leeward Islands	725	142	St. John (Antigua) . .	Colony	
(Antigua, St. Kitts-Nevis, Dominica, Montserrat, and the Virgin Islands)					
Newfoundland and Labrador .	c. 152,000	294	St. John's	Colony, Constitution sus- pended	Vice-Adm. Sir H. T. Walwyn. Maj. Sir H. W. Young. Sir H. B. Popham.
Trinidad and Tobago	1,980	456	Port of Spain	Colony	
Windward Islands	521	213	St. George's (Grenada) .	Colony	
(Grenada, St. Vincent, and St. Lucia)					
<i>Oceania</i>					
Commonwealth of Australia .	2,974,581	6,867	Canberra	Dominion	Brig.-Gen. Lord Gowrie. Premier: R. G. Menzies. Sir H. C. Luke. The Viscount Galway. Premier: M. J. Savage.
Fiji	7,055	205	Suva	Colony	
New Zealand	103,415	1,602	Wellington	Dominion	
Papua	90,540	280	Port Moresby	Part of Commonwealth of Aus- tralia	Sir H. Murray. Sir H. C. Luke. Sir H. C. Luke. Brig.-Gen. W. Ramsay McNicoll. M. J. Savage. Lt. Col. F. R. Chalmers.
Pacific Islands	11,911	162	. . . . .	Colonies and protectorate . .
New Hebrides	5,700	60	Vila	Condominium	
New Guinea, Territory of . .	93,000	670	Rabaul	Mandated territory	
Western Samoa	1,133	58	Apia	Mandated territory	
Nauru	8	3	. . . . .	Mandated territory

*Estimates, Dec. 31, 1937.

British Guiana, a British colony in north-eastern South America; language, English; capital, Georgetown; governor, Sir Wilfred E. F. Jackson. The area is 89,480 sq.mi.; population, 310,933 (census, 1931); (official estimate, 1938, 337,521), of which 42% are East Indians, and 39% Negroes. The chief cities are Georgetown, 67,584; New Amsterdam 9,514.

Late in Feb. 1939, the colony experienced serious rioting, the outgrowth of a strike of sugar workers. Three persons were killed. At the outbreak of the European war, British Guiana, in common with other parts of the British Empire, took steps to strengthen its defences.

The most significant event of the year, however, was the report of the British Guiana Refugee Committee named in 1938 to study the possibilities of large scale colonization of political refugees in the colony. In April, after studying an area of 25,000 sq.mi. in extent, the Commission recommended that, although the territory was not "ideal" for Middle Europeans and was not suitable for "immediate large-scale settlement," nevertheless, trial settlements involving 3,000 to 5,000 settlers should be started, and the supervision of adequate technicians and specialists be accorded. Cost for two years was roughly estimated at \$3,000,000. Outbreak of war in Europe, however, precluded immediate action. There are 79mi. of railway, 322mi. of main highways, and several navigable rivers. In 1938 imports, comprising foodstuffs, manufactured goods, and lumber, totalled \$10,620,972, largely from Great Britain (50%), Canada (15%), and the United States (11%); exports, largely sugar products (61.6%), bauxite (15.1%), gold (7.7%), rice (4.3%), with some diamonds, aggregating \$13,327,301, went to Canada (53%), Great Britain (34%), other parts of the Empire (5%), and the United States (4%). The export commodities are the principal products. Sugar production provides direct employment for 33% of the wage earners. The monetary unit is the dollar, approximately equal to the United States dollar. There were 239 primary schools (1938 enrolment: 53,373) and seven secondary schools, maintained at a cost to the Government of \$508,894.

(L. W. BE.)

British Honduras, British colony in northern Central America; language, English; capital, Belize (pop. 16,687 in 1931); governor, Sir Alan C. Maxwell Burns. The area is 8,598 square miles. The population (1931 census: 51,347) was officially estimated at 57,767 as of Dec. 31, 1938. The col-

ony's boundaries have been long regarded as settled under a treaty with Guatemala in 1859; however, agitation in that country for the treaty's nullification and the eventual annexation of British Honduras was strong throughout 1939, although it had little effect in British Honduras. The colony has direct steamship communication with New Orleans, Jamaica, Liverpool, and other points. Air service to the outside is maintained by a Mexican line to Mérida (Yucatan), connecting with the Pan American Airways system. Domestic air service connects Belize with several interior points. There are 25mi. of railway and over 200mi. of motor highway, but rivers are the chief means of internal transport.

British Honduras is an important trade intermediary between southern Yucatan and the United States, with re-exports valued at \$1,557,110 in 1938. Total imports in 1938 were \$4,004,091, from the United States (30.8%), Mexico, including re-exports (24.6%), and Great Britain (19.1%); exports totalled \$3,263,384, to the United States (72.9%) and Great Britain (12.7%). Principal exports are mahogany and other logwood, chicle, and bananas. These commodities, rice, sugar, and citrus fruits, are the principal products. The monetary unit is the British Honduras dollar (value: approx. \$1 U.S.). The colony has 106 elementary schools (78 maintained with Government aid), with a total enrolment of 10,021 in 1938, and five secondary schools with 456 enrolment.

(L. W. BE.)

British Legion. The legion, founded in 1921 by the late Field Marshal Earl Haig, has a membership of over 500,000, now organized in 4,412 branches, with a women's section of 1,800 branches. Through its 4,000 local benevolent committees it cares for all ex-Service men, and proposes to include those from the European war of 1939. The various centrally controlled organizations continued their work during the year; 200 pensioners were added to the 2,000 already receiving 10s. a week from the Pension Fund; and in many districts branches gave personal support to the National Defence Companies, the Auxiliary Fire Service, etc., and undertook Air Raid Precautions organization with much success. Nearly 400 disabled men are permanently employed at Richmond in the making of the 44,000,000 poppies annually required for Armistice—or Remembrance—Day, and it was announced in October that the collection on that day in 1938, namely £578,188, was a record and that nearly £7,632,500 had been collected in this way since the start in 1921.

At the beginning of August a party of nearly 1,100 visited Paris at the invitation of the French ex-Service organization and Government in commemoration of the 25th anniversary of Britain's entry into the World War.

British Medical Association. A national conference on the wider aspects of nutrition was held in London April 27-29. The discussion centred mainly on the section of the population whose wages are insufficient to provide the necessary supply of vitamins and calories, but it also touched on the wider problem of those who can feed themselves adequately, but choose the wrong foods and cook them badly. In addition to medical men the conference was attended by representatives of agriculture, at home and overseas, industry, and education.

British Pacific Islands: see PACIFIC ISLANDS, BRITISH.

British Possessions in the Mediterranean.

These comprise Cyprus, Gibraltar, and the Maltese islands of which the table below gives certain essential statistics. Sir Richard Palmer, whose term of office as Governor of Cyprus was extended until April 20, 1939, was succeeded by W. D. Battershill, who arrived in Cyprus on August 10. The demand of the Cypriots for self-government continued unabated; but their loyalty to the Empire was proved by the thousands of recruits who, after the outbreak of war, volunteered for service in the British Army. A light railway was brought into operation to bring ore from the Kalavaso mine to the coast; and schemes were put in hand by the newly established Irrigation Department.

Sir Edmund Ironside resigned the governorship of Gibraltar in June to become Inspector-General of Oversea Forces. He was succeeded by Lieut.-Gen. Sir Clive Liddell. The Spanish situation necessitated certain military precautions and led to some regrettable incidents; but on September 28 the governor received a friendly official visit from the Governor of Algeciras.

The new Maltese constitution was promulgated on February 25. It provides for a Council of Government with 10 elected members, 8 official members, and 2 nominated by the governor. Business is to be conducted in English, but at the governor's discretion Maltese may be used. The Council opened on July 31, with 6 Constitutionals, 3 Opposition Nationalists, and one Labour member elected. On September 20 a bill was passed providing for a territorial force for Malta.

History.—The High Commission territories of Basutoland, Bechuanaland and Swaziland are governed by resident commissioners under the direction of the High Commissioner for South Africa. During 1939 Sir E. Harding was appointed High Commissioner to succeed Sir H. Clarke. All those territories are largely dependent on the economic system of the Union of South Africa: large numbers of the adult male population work in the Rand gold mines.

The Basutoland expenditure on education amounts to about 21% of the total expenditure, and as the main occupations of the people are agriculture and animal husbandry, attention is paid to the training of demonstrators in these subjects. Soil erosion is widespread: the Colonial Development Fund has granted a loan of £160,233 for anti-erosion measures. A geological survey is being undertaken, financed by the Colonial Development Fund in the hope of finding coal to take the place of cattle manure as fuel and so benefit agriculture. The people of Bechuanaland are largely pastoral.

Gold and silver are produced in the Tati district. The output of 191,111 oz. of gold in 1938 constitutes a record. The Bechuana people show enthusiasm for education and in 1939 set aside more than 40% of the revenue of their Native Treasury for this purpose.

Basutoland.—Principal products, 1938 (in metric tons): wheat, 23,384; maize, 791,352. Imports and exports, 1938: imports, £749,000; exports, £402,000. Roads, 502 miles. Revenue and expenditure, 1938-39: revenue, £421,000; expenditure, £381,000. Education (elementary and secondary), 1937: elementary schools, 782; other schools, 59; total schools, 78,658.

Bechuanaland.—Principal products, 1938: gold, 19,111 oz.; silver, 1,127 ounces. Imports and exports, 1938: imports, £361,000; exports, £376,000. Roads, 2,048 mi.; railways, 396 miles. Revenue and expenditure, 1938-39: revenue, £190,000; expenditure, £203,000. Education (elementary and secondary), 1937: schools: European, 12; coloured, 2; native, 117.

Swaziland.—Principal products, 1938: gold, 1,246 oz.; tin, 174 tons. Exports, £116,000. Roads, 654 miles. Revenue and expenditure, 1938-39: revenue, £115,000; expenditure, £161,000. Education (elementary and secondary) 1937: European schools, 7; pupils, 354; pupils at native schools, 4,975; coloured: schools, 1; pupils, 38.

(J. L. K.)

British West Africa. Under this heading are grouped the British colonial territories on the west coast of Africa, for which certain essential statistics are given

British Possessions in Mediterranean

Territory and Area in sq. mi.	Principal Products 1938 (in metric tons)	Imports and Exports 1938 (in thousand £)	Road, Rail and Shipping 1938	Revenue and Expenditure 1938 (in thousand £)	Education, Elementary and Secondary 1938
GIBRALTAR, 13½ . . . .	..	free port; no statistics kept	shpg. cleared, 13,748,978 tons net	rev. 208 exp. 200	elem. schools 13; scholars 2,714; sec. schools 4; scholars 450.
MALTA, 122	potatoes, 28,400 wheat, 8,100	imp. 3,866 exp. 219 re-exp. 468	rds. Malta 267 mi. Gozo 68 mi.	(est. 1939-40) rev. 1,524 exp. 1,517	elem. schools 82; scholars 20,118; sec. schools 3; scholars 1,244
CYPRUS, 3,572	wines, 226,801 hectolitres pyrites 501,484	imp. 2,267 exp. 2,391	rds. 862 mi. rlys. 71 mi.	rev. 1,023 exp. 908	elem. schools: Christian 492; Moslem 212; scholars: Christian 37,640; Moslem 7,493; sec. schools: 34; scholars 4,463.

British Somaliland: see BRITISH EAST AFRICA.

British South Africa. Under this heading are grouped the British protectorates in the south of Africa. See BRITISH EMPIRE for population, capital towns, status and governors.

For other territories of the British Empire in the south of Africa see SOUTH AFRICA, THE UNION OF.

in the table on p. 117. See BRITISH EMPIRE for population, capital towns, status and governors.

History.—In the political sphere the four principal territories, viz., Nigeria, the Gold Coast, Sierra Leone, and the Gambia, have been brought closer together by a conference of governors which held its first meeting during 1939 and discussed a wide variety of subjects of common interest, economic and administrative. The conditions of world markets reacted unfavourably on revenue:

British West Africa

Territory & Area in sq. mi.	Principal Products exports 1938 (in tons)	Imports & Ex- ports 1938 (in thousand £)	Road, Rail & Shipping 1938	Revenue & Ex- penditure (in thousand £)	Education: Elementary & Secondary 1938
NIGERIA (including British Mandate of Cameroons) 372, 674.	palm kernels 312,048; ground nuts 180,136	imp. 8,632 exp. 9,461	rds. 13,690 mi. shpg. cleared 2,012,498 net tons	(est. 1940) rev. 6,221 exp. 6,477	(1937) elem. schools 543; scholars 24,630.
GOLD COAST (includ- ing Ashanti, Northern Terri- tories, and British Mandate of Togo- land) 91,843. . .	cocoa 263,229; gold 677,480 fine oz.	imp. 10,380 exp. 11,080	rds. 2,286 mi. rly. 500 mi. shpg. (1937) cleared 2,614,021 net tons	(1938-39) rev. 3,780 exp. 3,489	elem. schools 027, scholars 83,824; sec. and higher educ. scholars 2,078
ST. HELENA (47) and ASCENSION IS- LANDS (34) . . .	flax fibre 284; tow 199	imp. 38 exp. 7	rds. 45 mi.	(est. 1939) rev. 16 exp. 15	812 scholars.
GAMBIA 3,999 . . .	ground nuts (total) 46,204; palm kernels 681	imp. 406 exp. 256	rds. 869 mi. shpg. (1937) cleared 651,525 net tons	(1938) rev. 167 exp. 263	(1937) elem. schools 14; scholars 2,198; sec. schools 5, scholars 201
SIERRA LEONE 27, 925.	diamonds (total) 689,622 carats; iron ore 861,955	imp. 1,500 exp. 2,389	rds. 922 mi.; rly. 310 mi. shpg. entered 2,725,783 tons	(est. 1939) rev. 809 exp. 940	elem. schools 253; scholars 20,851

the prosperity of the West Coast depends largely on the cocoa trade. The Gold Coast cocoa crop is estimated at 250,000 tons and that of Nigeria at over 100,000 tons—these two territories, which in 1914 produced a negligible quantity, now supply the needs of Great Britain and account for more than half the world's supply.

The social services in the fields of health, education, and agriculture, show continued expansion. In Nigeria a scheme for the control of sleeping sickness is financed from the Colonial Development Fund and it is estimated that some 200,000 people will be protected by these measures from attacks by the disease. About 30 Africans are at present undergoing advanced medical training at Yaba college. Some labour unrest took place in Sierra Leone. The labour departments of Nigeria, the Gold Coast, and Sierra Leone have been strengthened and the Labour Adviser to the Colonial Office is touring West Africa to survey labour conditions. Legislation for the regulation of trades unions has been introduced in Nigeria and Sierra Leone.

In Nigeria local government is in the hands of the Africa authorities—Emirs, chiefs and their councils, who dispose of considerable revenues and finance social services. This system of local government, known as "indirect rule," is being extended with success in the Sierra Leone Protectorate where some 700,000 out of a population of 1,600,000 now live under this form of government. In the Gambia native administrations are also developing. In the Gold Coast the system of local government has been described as a mixture of direct and indirect rule, with a bias towards the latter. Except in the Northern Territories, the chiefs are unwilling to accept a system which implies a control of native treasuries, and there is no direct taxation from which these treasuries can be financed. The central government depends largely on a duty on cocoa exports.

(J. L. K.)

Broadcasting. During 1938 radio's most conspicuous achievement was its coverage of the two major international crises. But what was considered in 1938 unusual and exceptional in 1939 became daily and routine.

During the grim prologue to war, and after the declaration of war every movement on the diplomatic fronts, every important speech, every governmental declaration sounded in American radios. A succession of broadcasts from the chief European capitals brought kings, dictators, presidents, and prime ministers into 27,000,000 American homes. On the eventful first Sunday in September, the day England declared war on Germany, on one network alone 78 broadcasts were devoted to news, 20 from foreign countries. King George, Prime Minister Chamberlain, Premier Daladier, Prime Minister Mackenzie King and President

Roosevelt were among those who spoke on that day.

Americans heard the declaration of war hours before the news reached the German people. At 6 A.M., New York time, in a radio speech, Chamberlain declared war. A few moments later radio networks switched to Berlin. There it was learned that the German people and the news commentator himself were unaware that war had been declared and the broadcast told of German hopes for a last minute peace.

Today, actual warfare is broadcast. The U.S. heard the bombs that fell on Poland, the bitter

clash of Russian and Finnish troops from "somewhere in Finland." Through radio America has been able to follow every step in this world drama of war and peace.

The crises and war wrought a tremendous change in the whole structure of American broadcasting. The end of 1939 found American radio adjusted to broadcasting war. At one time commercial shows were ruthlessly interrupted and cancelled at frequent intervals for news reports. Now, there are daily pickups from foreign countries and special periods are set aside for talks by leading world figures. Radio has evolved order out of the chaos produced by crises and war.

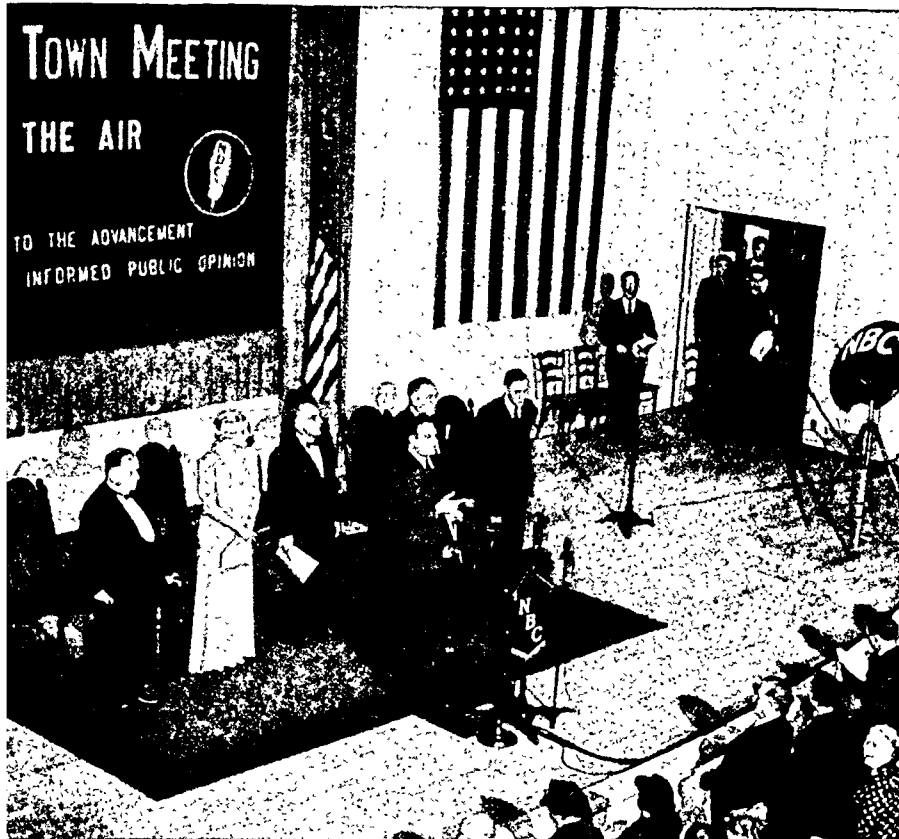
Radio advertisers were the first to realize that America's dependence on radio for news made air time more valuable. Despite temporary losses during crisis periods radio has had the most successful financial year in its history. The three major networks showed an increase in profits of 13% over last year. Proof of listener interest was the fact that 9,000,000 new sets, particularly portables, went into United States homes during 1939, increasing the total number of sets in use throughout the country to 45,000,000.

Since radio's inception, broadcasters, the Government, and the public have recognized the need for certain regulation. The question always has been: who is to regulate? July 1939 the National Association of Broadcasters drew up its own code dealing with radio policies.

In a speech entitled "The Code Preserves Free Speech," Neville Miller, president of the N.A.B., said that: "There was a danger that due to the mere possession of money, various groups might monopolize, dominate or control the discussion of public issues over the radio, precluding a fair opportunity for the opposition, without financial resources to present its side of the case, and that such a situation would pervert the functions of American radio as a form of democracy, and would irreparably shatter the confidence of the public in the American system of broadcasting."

Representing the opposing viewpoint, David Lawrence, editor of the *United States News*, said, "The N.A.B. says that it will gladly give 'free time.' There we encounter the true censorship difficulty. Occasionally—but not regularly—and 'when facilities permit,' there will be 'free time.' The opportunity to have a regular week-by-week program on a controversial subject is, therefore, to be denied hereafter to any group or organization or citizen. You can buy time for a series of programs to sell toothpaste, but not to sell ideas."

The new code has evolved out of the N.A.B.'s conviction that unless radio regulates itself the Government will do so. Critics of the N.A.B. point out that the free speech provisions in the Con-



Upper left: "INFORMATION PLEASE" continued its popularity in 1939. Left to right: Oscar Levant, John Kieran, Moe Berg (a guest) and Franklin P. Adams, members of the "board of experts" which answers questions submitted by radio listeners and presented by Clifton Fadiman (upper right)

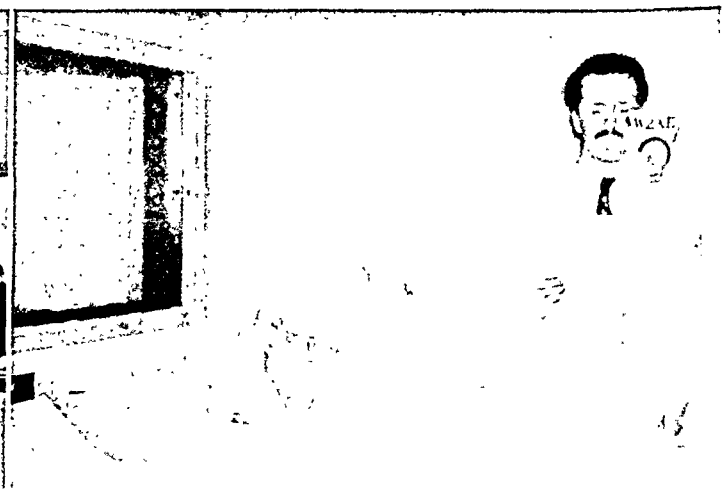
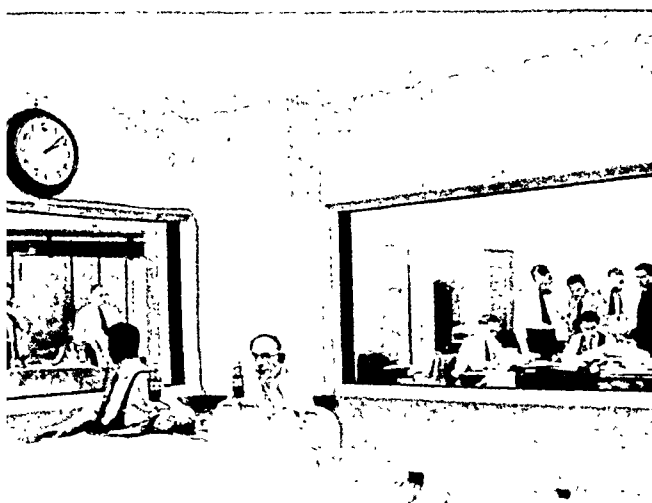
Upper right: CLIFTON FADIMAN, master of ceremonies of "Information Please"

Above, left: HAROLD L. ICKES AND GEN. HUGH S. JOHNSON debated the subject "How Can We Defend Democracy?" Oct. 5, 1939, to begin the fifth year of the "Town Meeting of the Air" broadcast

Above, right: BROADCASTING THE BULLETIN early Sept. 3, 1939, in which Chamberlain announced a state of war between Great Britain and Germany

Below, left: "STUDIO NINE," designed especially by Columbia Broadcasting System to facilitate broadcasts of news bulletins, was completed just before the war began. Bob Trout, news reporter, and Elmer Davis, news analyst, are seated at the table

Below, right: SHORT-WAVE BROADCASTING by American stations to Europe and South America increased greatly in 1939 as a direct result of the European war



stitution are sufficient guarantee against any Governmental censorship.

The most conspicuous man in radio in 1939 was Elliott Roosevelt, son of President Roosevelt. For the last few years he has been working in radio. Until this year he confined his work to the management of several small stations owned by William Randolph Hearst. Last spring, the Emerson Radio Corporation sponsored Elliott Roosevelt as a news commentator on the Mutual Network. Special attention was focused on him because of his outspoken criticism of Father Coughlin. Last fall he left commenting to assume leadership of a proposed new network intended to take its place along with the National, Columbia, and Mutual Networks. Incidentally, Mr. Roosevelt has been one of the strongest critics of the N.A.B. code and resigned from the Association rather than accept its ruling prohibiting the sale of time for controversial issues. The end of the year finds the fourth network without sufficient financial backing to operate. Elliott Roosevelt has resigned leadership of it.

A full schedule of special event broadcasts was provided throughout 1939. These included a description of the funeral ceremonies of Pope Pius XI and the coronation of his successor, Pius XII, the sinking of the submarine, "Squalus," the visit to America of Britain's King and Queen, and the opening of World Fairs in New York and San Francisco. The most dramatic special broadcast came in the last days of December with an eye witness account of the scuttling of the German battleship "Graf Spee."

The most popular new program was "Information Please" heard each week over N.B.C. Ever since "Professor Quiz," question and answer programs have found favour with radio audiences. "Information Please" is a quiz program on a high intellectual level and as such has attained its present success.

One of the finest dramatic programs was the anti-Fascist verse play, "They Fly Through the Air." It was authored by Norman Corwin, a new writer who has revealed a keen and imaginative understanding of radio as a dramatic medium.

Highlights of this musical year were Arturo Toscanini in his regular broadcasts and John Barbiroli conducting the New York Philharmonic. At frequent intervals outstanding musical artists such as Ignace Paderewski, Marian Anderson, and Jascha Heifetz broadcasted. Encouragement was given native American composers by those arranging serious music broadcasts.

Regular television programs were inaugurated in March with the National Broadcasting Company telecasting the opening of the New York World's Fair. However, it seems the public is still a little wary of television, for less than 1,000 sets were sold throughout the United States in 1939. This year saw further technical improvements in television but not its emergence from the experimental stage. (See also RADIO, INDUSTRIAL ASPECTS OF; TELEVISION.) (R. KN.)

Great Britain.—While the B.B.C.'s change-over from a peace to a wartime basis was the overshadowing event of the year's broadcasting in Britain, the months of peace that preceded it showed steady development. During the year ending Nov. 30, 1939, the B.B.C.'s transmitters sent out 75,636 hours 50 minutes of broadcasting to listeners at home and 43,198 hours 38 minutes to Empire and overseas listeners. The opening of a new high power transmitter at Start Point, South Devon, and a medium transmitter at Clevedon, Somerset, brought improved reception to listeners in those regions. Work proceeded apace with the new extension to Broadcasting House, London.

As in other years, the corporation retained under contract many hundred musicians. The B.B.C. symphony concerts made their usual appearance during the winter season, and at the London Music Festival a Beethoven cycle of nine concerts was given by the B.B.C. Symphony orchestra; seven were conducted by Signor

Arturo Toscanini and two by Sir Adrian Boult.

Television continued to improve its position and when, owing to the war, the service closed down there were estimated to be 20,000 viewers, double the number of 1938. Plays, illustrated talks, ballet, variety and music were featured. People in their homes were enabled to view such happenings as the Boon-Danahar fight, the departure of the King and Queen for Canada, and the Derby. A television hour for young people was introduced.

Great events of 1939 closely followed by broadcasting were the State visit to England of the French President and Madam Lebrun and the Canadian tour of their Majesties King George VI and Queen Elizabeth. The King broadcasted on six occasions and the Queen broadcasted to women of the Empire on Armistice Day.

Throughout the year radio drama presented classic masterpieces of the theatre, and also a number of plays written specially for the microphone. The serial play took hold of the popular imagination.

Talks covered subjects practical, political and aesthetic, and contributed to the cause of adult education by the broadcasting for discussion groups of a number of series such as "The Pacific," "Australia Speaks," and "The Artist in the Witness Box." Local education authorities took increasing interest in this movement. Broadcast education made further strides, and in April 1939, 8,250 schools were registered as listening in England, Wales and Northern Ireland, and 1,262 in Scotland. On the outbreak of war these broadcasts proved valuable in assisting teachers with evacuated schoolchildren, and in bridging the gap between town and country children thrown together for the first time. Broadcast charitable appeals during the year realized an approximate figure of £224,220. This included the highest figure ever recorded, namely that obtained by Lord Baldwin's appeal for seamen and their dependents on December 17, which realized £74,000 in four weeks.

The coming of the war imposed serious limitations upon broadcasting, though it also opened up new opportunities. In the interests of national security and to avoid giving navigational aid to enemy aircraft, the traditional alternative program system was abandoned, and replaced by a single home service program. Starting at 7 A.M. and concluding at 12:15 A.M., this allowed for a longer broadcasting day than in peacetime.

Children's Hour, though reduced to a week-day period of 30 minutes, appeared for the first time as a regular Sunday afternoon program. The number of broadcast religious services was increased.

The B.B.C.'s overseas services were rapidly extended. To the well established Empire service were added daily broadcasts in Arabic, French, German, Italian, Spanish (for Spain and Spanish-America), and Portuguese (for Portugal and Brazil), and soon after the outbreak of war there were transmissions in Czech, Greek, Magyar, Polish, Rumanian, Serbo-Croat and Turkish. Broadcasts in Afrikaans were sent out to the Union of South Africa. Of particular wartime importance was the formation of the "monitoring" unit by means of which a 24-hour per day vigil was kept upon world broadcasting to the extent of some 250,000 words per day.

Although, upon the outbreak of war, the B.B.C., like the press, became subject to censorship requirements, the conditions of its charter and licence remained unchanged, and the corporation continued to function independently of Government control as a public service organization with its own board of governors. In order to facilitate the taking of quick decisions this board was reduced on the outbreak of war from seven to two. The year 1939 saw the retirement of R. C. Norman, for several years chairman, and the appointment in his place of Sir Allan Powell. (See also ADVERTISING.)

Bromine. The rapidly expanding demand for tetra-ethyl lead for treating motor gasolines has caused a marked increase in bromine production, since bromine is required in the preparation of the lead compound. The 1938 production of 33,500,000 lb. in the United States is estimated to have been about 80% of the world total. Little information is available on sources outside the United States, but Germany recovers bromine from salt and potash operations; France is apparently next in importance; the British plant for the treatment of Dead Sea brine has a considerable output; and Italy has a small output.

(G. A. Ro.)

Bronx-Whitestone Bridge: see BRIDGES.

Brookings Institution. The research program carried on at the Brookings Institution during the calendar year 1939 included studies of many important problems in the fields of economics and government. Among those completed were the following: "Reorganization of the National Government," by Lewis Meriam and Laurence F. Schmeckebier; a study of ways in which the Federal Government can be made more efficient and economical. "Government and Economic Life," by Leverett S. Lyon, Myron W. Watkins, and Victor Abramson; a broad analysis of the fundamental issues involved in the many and complex relations existing between Government and private enterprise. "Capital Expansion and Economic Stability," by Harold G. Moulton and others; a comprehensive investigation of the significance of, and problems involved in, the reopening of the capital markets. "Wages, Productivity, and the National Income," by Spurgeon Bell; a study of the significance of wages as part of the national income, and of the relationship of productivity to wages. "British Wages Boards," by Dorothy Sells; an inquiry into British experience in an endeavour to throw light upon wage and hour legislation and administration in the U.S.

In pursuance of the Institution's training program, 17 resident fellowships for work in the social sciences were granted to advanced graduate students for 1939-40. (H. G. Mo.)

Broun, Heywood (Campbell) (1888-1939), U. S. journalist and author, was born December 7 at Brooklyn, New York. After four years of study at Harvard he became a reporter for *The Morning Telegraph* in New York city. From 1912 to 1921 he was a sports writer and drama critic for *The New York Tribune*, and for seven years thereafter wrote a daily column for *The New York World*. This column, "It Seems to Me," a miscellany of personal opinions, became one of the most widely read in the United States. Broun was associated with the Scripps-Howard newspapers from 1928 until several days before his death, when he transferred his column to *The New York Post*. A vocal liberal, he helped found the American Newspaper Guild in 1933 and was its first president. Among his works are *Seeing Things at Night* (1921), *Pieces of Hate* (1922), *The Boy Grew Older* (1922), *The Sun Field* (1923), *Sitting on the World* (1924), and *Gandle Follows His Nose* (1926). Broun died December 18 in New York city.

Brubacher, Abram Royer (1870-1939), American educator, was born at Lebanon, Pa., July 27 and was educated at Phillips academy, Andover, Mass., and at Yale. After teaching Greek for two years at Yale he became principal of the high school at Gloversville, N.Y. (1902-05) and at Schenectady, N.Y. (1905-08). From 1908 to 1914 he was superintendent of schools in the latter city, and in 1914 he became president of New York State college, retaining this position until his death on August 23. He was the author of several volumes on English grammar.

Bruce, Charles Granville (1866-1939), British soldier and mountain climber, was born on April 7, the youngest son of the first Baron Aberdare. When he was 22 years old he joined the British Army in Burma and served with distinction there and in many parts of India. During the World War he fought in Egypt and at the Dardanelles, where he was wounded. He retired from the army in 1920 after being made brigadier-general. In 1922 he led the expedition which climbed Mt. Everest to the height of 27,300 feet. Two years later he organized another expedition to scale the peak but before it could get under way he was stricken with malaria and forced to retire. His party, however, continued the preparations and in 1924 set the world's record for altitude in mountain climbing—28,200 feet. Bruce was the author of *Twenty Years in the Himalayas* (1910), *Kulu and Lahoul* (1914), *The Assault on Mount Everest* (1922-23), and *Himalayan Wanderer* (1934). He died at London on July 12. For Bruce's account of the two ascents of Mt. Everest, see *Encyclopædia Britannica*, vol. 8, pp. 900-2.

Brunei: see BORNEO.

Bryn Mawr College, a women's college located at Bryn Mawr, Pa., has an enrolment of 635 and a faculty and teaching staff of 109 for its 1939-40 session. The undergraduate body numbers 495, the largest in its history, owing to the completion of a new dormitory. During the summer of 1939 work proceeded on the wing of the library which, when completed, will provide adequate space for the departments of art and archaeology. The Mrs. Otis Skinner Theatre Workshop and Art Studios, completed in the autumn of 1939, affords to students an opportunity for independent work in dramatic production and practical art. The new buildings provide facilities for an extensive academic program combining formal course work with independent and tutorial work as well as for dramatic experimentation and recreation. The Mary Paul Collins Scholarship for Foreign Women, awarded in the furtherance of a research project in the graduate school, was offered in 1939 in the Spanish department, the project a research problem on the materials, technique or expression of the Peninsular or Spanish-American drama during the 16th and 17th centuries. The plan for co-ordination in the teaching of the sciences is applied to all advanced work, integrating the work of the biology, physics, geology, chemistry, and mathematics departments and promoting study in the fruitful borderline research fields such as geophysics, biophysics, and biochemistry. (M. E. Pa.)

Buckwheat. The smallest buckwheat crop on record was reported in the United States in 1939. Preliminary estimates placed the yield at 5,767,000 bu. compared to 6,682,000 in 1938 and a 10-year average (1928-37) of 7,964,000 bushels. About two-thirds of the crop was grown in New York and Pennsylvania. Reduced acreage and hot weather during the blossom period caused the short crop.

Estimated Production of Buckwheat by States

	1938 bu.	1939 bu.		1938 bu.	1939 bu.
New York	2,406,000	2,055,000	North Carolina	52,000	60,000
Pennsylvania	2,170,000	1,725,000	Iowa	45,000	45,000
West Virginia	250,000	270,000	North Dakota	63,000	42,000
Michigan	213,000	234,000	Vermont	34,000	40,000
Ohio	210,000	210,000	South Dakota	42,000	37,000
Maine	130,000	190,000	Illinois	50,000	30,000
Virginia	162,000	180,000	Kentucky	27,000	26,000
Minnesota	172,000	180,000	Tennessee	27,000	25,000
Indiana	106,000	154,000	New Jersey	17,000	17,000
Wisconsin	150,000	120,000	Delaware	13,000	11,000
Maryland	120,000	100,000	Missouri	10,000	10,000

(S. O. R.)

Budget. The Budget and Accounting Act of 1921 provided the United States with a national budget system and created a Bureau of the Budget to prepare for the President the Budget of the United States Government. The Act directs the President to submit to Congress on the first day of each regular session a budget which shall set forth in summary and in detail the expenditures and receipts of the Government for the fiscal year just completed, estimated expenditures and receipts for the current and for the ensuing fiscal years, and balanced statements showing the condition of the treasury at the end of each of these periods. Information regarding the indebtedness and financial condition of the Government and recommendations for new taxes and loans are also included in the budget document.

The executive departments and agencies are required to submit every year to the Bureau of the Budget by September 15 detailed estimates of their expenditures for the next fiscal year. The Bureau then conducts intensive hearings at which the departments and agencies defend and justify their estimated expenditures. The departmental estimates may be revised, reduced, or increased by the Bureau. The President, in conference with the director of the Bureau of the Budget, indicates points at which any changes should be made to conform with his general fiscal program.

1940 Appropriations for Governmental Departments and Agencies as shown in the 1941 Budget Statements adjusted to reflect transfers under authority of Reorganization Plans I and II.

Legislative Establishment	\$ 22,715,643.00
Executive Office and Independent Establishments:	
Executive Office	2,800,405.00
Civil Aeronautics Authority	25,768,000.00
Civil Service Commission	91,404,000.00
Employees Compensation Commission	10,268,400.00
General Accounting Office	10,531,540.00
Interstate Commerce Commission	8,948,000.00
National Labour Relations Board	3,189,600.00
Railroad Retirement Board	130,054,000.00
Securities and Exchange Commission	5,470,000.00
United States Maritime Commission	100,000,000.00
Veterans' Administration	557,078,000.00
Federal Security Agency:	
Civilian Conservation Corps	294,955,000.00
National Youth Administration	99,079,240.00
Social Security Board	309,039,790.00
Other	58,502,270.00
Total, Security Agency	822,476,300.00
Federal Works Agency:	
Works Projects Administration	1,476,921,000.00
Other	19,700,867.00
Total, Federal Works Agency	1,496,621,867.00
Other Independent Offices	19,966,320.00
Total, Executive Office and Independent Establishments.	3,290,576,432.00
General Public Works Program	751,715,508.00
Department of Agriculture:	
Department proper	124,964,150.00
Conservation and use of agricultural land resources	429,500,000.00
Agricultural Adjustment Administration	468,077,912.11
Farm Credit Administration	18,760,675.00
Rural Electrification Administration	42,799,000.00
Farm Tenant Act	40,965,730.00
Farm Security Administration	143,000,000.00
Total, Department of Agriculture	1,274,117,567.11
Department of Commerce	38,127,499.00
Department of the Interior	78,481,130.65
Department of Justice	37,494,620.00
The Judiciary	12,305,600.00
Department of Labour	28,668,880.00
Navy Department	720,789,461.00
Post Office Department, deficiency payable from general revenues	39,019,964.00
State Department	19,711,840.00
Treasury Department:	
Department proper	233,591,715.00
Old-age reserve account	580,000,000.00
Advances to Railroad Unemployment Insurance account	23,750,000.00
Payments to Federal Land Banks and Federal Farm Mortgage Corporation, reduction in interest	37,125,000.00
Restoration of capital impairment, Commodity Credit Corporation	119,599,918.05
Interest on the public debt	1,050,000,000.00
Public debt retirements	584,815,000.00
Total, Treasury Department	2,628,881,633.05
War Department:	
Military	660,167,878.00
Civil functions	47,684,900.00
Panama Canal	24,774,924.00
Total, War Department	732,627,702.00
District of Columbia (Federal Contribution)	6,000,000.00
Total, payable from general fund	9,681,233,539.81

The appropriation committees of Congress hold hearings on the estimates preparatory to consideration on the floor by both houses. Appropriation measures passed by Congress may be approved or vetoed in toto by the President. Supplemental or deficiency appropriations made necessary by new legislation or changed conditions, may be passed subsequent to the submission of the regular budget.

The various departments and agencies are then required to submit their plans of expenditures in schedules of monthly apportionments which the Bureau of the Budget may waive or modify. No expenditure in excess of the monthly apportionment may be made by any department or agency without the approval of the bureau.

The regrouping of agencies carried out under the Reorganization Act of 1939 transferred the Bureau of the Budget from the Treasury Department to the Executive Office of the President wherein are lodged the five agencies principally concerned with over-all management and central direction of the executive branch of the Federal Government. On Sept. 8, 1939, the President issued an Executive Order which specifically defined the functions and duties of the Bureau of the Budget. Besides assisting the President in the preparation and execution of the budget and the formulation of the fiscal program of the Government, the Bureau of the Budget conducts research in the development of improved plans of administrative management, develops reorganization proposals where they would be in the interest of economical and efficient administration, advises with the departments with respect to improved administrative organization and policy, clears and co-ordinates departmental advice on proposed legislation, assists in preparing proposed Executive Orders and Proclamations, co-ordinates Federal statistical services, and informs the President of the current and future work programs of the governmental agencies.

The Bureau of the Budget is thus charged with responsibility for assisting the President in the formulation of the United States Budget and the fiscal program of the Federal Government and with advising him as to improved and economical administration of the executive branch of the Federal Government. (See also UNITED STATES: *Budget*.)

(H. D. SH.)

Great Britain.—The outbreak of war on September 3 involved a drastic revision of actual and prospective British national expenditure, and it at once became clear that the 1939-40 budget of April, 1939, would have to be reinforced by a war budget. This was duly opened at the end of September, and so 1939 resembled 1931 and also certain of the 1914-18 war years in being notable for two budgets.

The April budget was over-shadowed by heavy defence expenditure in preparation for the war which shortly was to break out. Largely for this reason ordinary expenditure for 1939-40 was estimated at £942 millions compared with actual expenditure of £927 millions in 1938-39. Revenue for 1939-40 on the old basis of taxation was estimated at £918 millions, and so additional taxation was imposed to bring revenue up to £942 millions. Even this left a gap of £372 millions to be covered by defence borrowing.

The chief new taxes then imposed were the raising of the motor vehicle duty from 15s. to 25s. per horse-power; the scaling up of surtax (see INCOME TAX) and estate duty rates; and increases of 2s. a lb. in the tobacco duty and ¼d. a lb. (25%) in the sugar duty.

During the summer armaments profits duty on excess profits earned on armament manufacture was imposed.

On the outbreak of war, the estimates of expenditure for 1939-40 were drastically revised from £1,453 millions (the amended estimate current when war began) to £1,933 millions. Conversely the revenue estimates had to be scaled downwards by £54 millions, partly because petrol rationing and the laying-up of cars would make the motor vehicle duty much less productive. To meet these needs, the government decided to impose tax in-

creases designed to raise the year's revenue to £995 millions; leaving £938 millions to be covered out of borrowing. Although this new taxation only brought in £107 millions, the increases in taxation were drastic. Further increases were made in income tax, surtax and estate duty rates, and also in duties on alcoholic liquors, tobacco and sugar. These equalled an extra 1d a pint on beer, 1s.3d. per bottle on whiskey, 1½d. an ounce on tobacco and 1d. a lb. on sugar. National defence contribution and armaments profits duty were merged in a new excess profits tax of 60 per cent on all profits earned in excess of a pre-war standard. (N. E. C.)

Building and Building Industry. The construction industry in the United States enjoyed during 1939 its best year since 1929. Improvement was especially marked in residential building. *The American Builder* claims an increase in the number of non-farm dwelling units built during 1939 of about 37% as compared with 1938. It estimates the total for the year at 475,000. Other responsible forecasters place it as high as 500,000.

About 74% of all dwelling units built in 1939 were single family houses, and more than 65% of the single family houses were in the price range under \$6,000. Total cost of all home building for the year is placed at about \$1,900,000,000. A substantial proportion of this building took place in suburban communities too small to figure among the more than 2,000 cities reporting to the U.S. Bureau of Labor Statistics. All sections of the country showed increases in residential building, with the largest gains in the Middle Atlantic, East North Central and South Atlantic States.

The Federal Housing Administration continued to be an important factor in the stimulation of residential construction through its insurance of mortgages. During the year 1939 it accepted for insurance loans to a total amount of \$1,035,000,000, of which \$645,000,000 represented new construction, \$210,000,000 repairs and modernization, and \$180,000,000 refinanced mortgages on existing homes. New dwelling units provided for numbered something over 150,000.

During 1939 there were Federal investigations of practices in restraint of trade tending to increase building costs. How much effect they will have in discouraging such increase may be shown during 1940, when the stage seems set for increased production,

Estimated Cost of Building Construction in Reporting Cities of 2,500 Population and Over, First 11 Months of 1938 and 1939

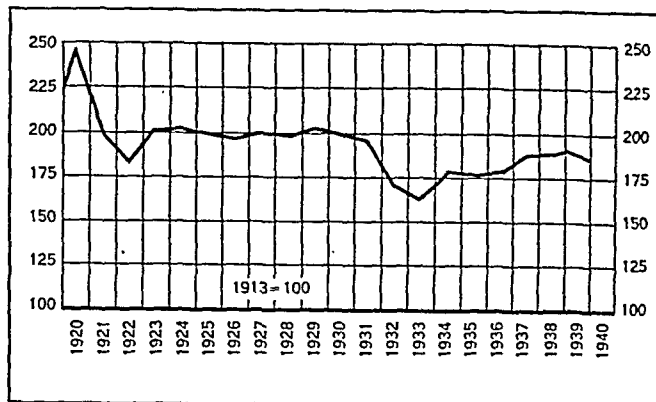
Type of Construction	First 11 Months of		Percentage change
	1939	1938	
Total construction . .	\$1,890,737,600	\$1,553,692,663	+21.7
New residential . . .	1,037,444,771	777,572,148	+33.4
New non-residential .	541,698,612	486,521,671	+11.3
Additions, alterations, and repairs	311,594,217	289,598,844	+7.6

Number of Families Provided for in New Residential Construction in 257 Identical Cities, 1921 to 1939

Year	Families Provided for	Year	Families Provided for	Year	Families Provided for
1921	224,545	1928	388,678	1934	20,952
1922	377,305	1929	244,394	1935	55,490
1923	453,673	1930	125,315	1936	114,789
1924	442,096	1931	98,158	1937	117,323
1925	491,032	1932	27,380	1938	157,104
1926	462,208	1933	25,885	1939*	214,000
1927	406,095				

*Preliminary figure.

The tables above were prepared by the Division of Construction and Employment of the U.S. Bureau of Labor Statistics.



COSTS OF CONSTRUCTION (all types): Index of Associated General Contractors of America, Inc.

which is usually accompanied by rising costs. The question has been raised whether existing anti-trust laws would not render illegal in the United States an open agreement in the public interest *not* to increase prices, such as that of 1924 in Great Britain, which proved so beneficial to all concerned.

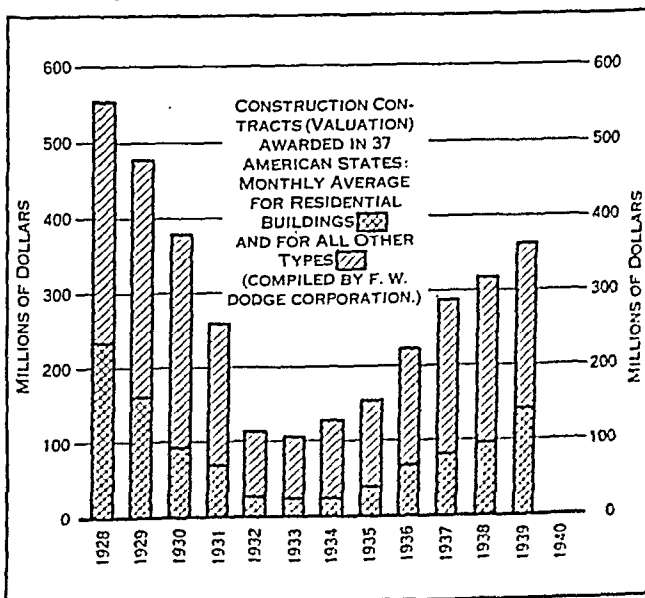
BIBLIOGRAPHY.—Publications of the U.S. Bureau of Labor Statistics; Bureau of Foreign and Domestic Commerce; National Resources Committee; Federal Home Loan Bank Board; Federal Housing Administration; F. W. Dodge Corporation; National Bureau of Economic Research.

(E. E. Wo.)

Great Britain.—Building is an enormous industry spread all over the country in large and small units employing directly or indirectly some 2,500,000 persons.

During the early part of 1939 building activity was increasing rapidly and by the summer the industry was heavily engaged, largely as a result of Air Raid Precaution and defence work. In July direct employment in building and contracting had risen to 1,167,000 and it has been estimated by the Building Industries National Council that work on building was then proceeding at the rate of £400,000,000 per annum.

On the outbreak of war a large volume of Government work was in progress or contemplated on account of the expansion of productive effort and the need for increased storage. Doubtless with these considerations in mind the authorities made sweeping restrictions which have led to almost complete stoppage of new civil building work. The effect of such measures is shown by the fact that the number of operatives unemployed in October, was one third greater than in September in spite of the increase in



Government work and the depletion of the labour market due to the calling up of tradesmen for military service.

There is concern in the industry and associated interests at the results of these restrictions on civil building. The Government has naturally first claim on the resources of all industries for war purposes, but it seems essential to build up the national income by permitting as much civil activity as possible in order to increase the yield of taxation. The stimulating effect of a healthy building industry was amply demonstrated on its recovery following the depression.

If all sections of the industry had been brought into close contact with the responsible authority during the implementation of the rearmament program or at the outbreak of war, the resultant disruption might have been avoided.

The adequate organization of building programs, materials supply, classification of demands in order of urgency, elimination of inter-departmental competition, and the investigation of substitute materials, would make available a greater margin of resources for utilization in civil work spread fairly throughout the country. (See also HOUSING; UNITED STATES: *Housing*.)

(N. KE.)

Bulb Flowers: see HORTICULTURE.

Bulgaria. Area 39,814 sq.mi.; population (est. June 30, 1938) 6,360,500. Chief towns: Sofia (cap. incl. suburbs, April 1938; 335,000); Plovdiv (1937; 106,000); Varna (1934; 73,759); Rousse (1934; 49,447). Ruler, King Boris III; language, Bulgarian; religion, Christian, mainly Orthodox (Mohammedan 1934, 821,298).

History.—The early months of 1939 passed quietly in Bulgaria. Her relations with Turkey and Yugoslavia continued good, but ill-feeling against Rumania was kept alive by the shooting of 22 Bulgars in the Southern Dobruja (May 22). The Rumanian question, in particular, kept Bulgaria from joining the Balkan Entente. Relations with the U.S.S.R. also improved remarkably, and there were negotiations for increasing the trade between the two countries. On the outbreak of war, Bulgaria declared a policy of strict neutrality, but public opinion clearly felt the time approaching when Bulgaria's claims against Rumania in the Southern Dobruja could be pressed, and unlike her neighbours, she hailed with some enthusiasm the return of the U.S.S.R. to an active policy resembling that of pre-1914 Russia. It was Bulgaria's attitude which formed the chief obstacle to the formation of a neutral "Balkan Bloc."

On October 19 the Government resigned. A reconstruction on a more parliamentary basis was expected, there having been general complaints that the Government did not work with parliament; but when M. Kiussévanoff reconstituted his cabinet on October 23, only one member of it was drawn from parliament. It was stated that policy would be unchanged. Elections were announced for the end of the year.

(N. MAC.)

Education.—In 1937-38: primary schools 7,263; scholars 955,292; total number of schools 8,013; scholars 1,098,986.

Banking and Finance.—Revenue, ordinary (actual 1938), 7,686,600,000 levs; (est. 1939), 7,057,100,000 levs; expenditure, ordinary (actual 1938) 7,207,000,000 levs; (est. 1939), 7,626,300,000 levs; public debt (Dec. 31, 1938) 21,778,880,000 levs; notes in circulation (monthly average 1938), 2,628,000,000 levs; gold reserve (Dec. 31, 1938), 2,006,000,000 levs; rate of exchange 360 levs=£1, sterling.

Trade and Communication.—Foreign trade 1938, merchandise: imports 4,934,193,000 levs; exports 5,578,341,000 levs. Communications (Jan. 1939): roads, national, suitable for motor traffic 11,866mi.; railways open to traffic 1,818mi.; motor vehicles li-

censed (Dec. 31, 1937): cars 3,020; commercial 1,091; cycles 1,352; wireless receiving set licences (1937) 31,658; telephone subscribers (1937) 24,000.

Agriculture and Manufactures.—Production in 1938: (in metric tons), wheat 2,149,674, (1939) 1,936,500; maize 518,332; barley 353,914, (1939) 333,800; rye 188,023, (1939) 245,700; potatoes 148,332; lignite 1,941,000; coal 145,000; oats 88,591, (1939) 127,900; tobacco 17,153; beet sugar 21,000; rice 19,100; wool 11,200; cotton, ginned 6,900; rape seed 20,600; hemp (fibre) 4,100.

(W. H. WN.)

Bureau of Standards, National: see STANDARDS, NATIONAL BUREAU OF.

Burma. Area 261,610 sq.mi.; pop. (est. Dec. 31, 1936) 15,600,000. Chief towns: Rangoon (cap., 400,415), Mandalay (147,932), Moulmein (65,506). Governor: The Rt. Hon. Sir A. D. Cochrane; prime minister: The Hon. U. Pu; languages: Burmese and English; religion: Buddhist (84%).

History.—The year 1939 commenced with strikes at schools and colleges, in transport and industrial concerns. Settlement, however, soon followed. Dr. Ba Maw's ministry, defeated in the legislature, was succeeded by a new administration with U. Pu as premier. New institutions were—a State Polytechnic; a State Translation Bureau, to make available in Burmese latest scientific and arts treatises; a 10-kw. station at Rangoon broadcasting daily news, talks, music and light entertainment.

An enlarged and reconstructed wharf was added to the amenities of Rangoon port.

The legislature passed in 1939 a Land Tenancy Act which deals with the problems of stable tenancies and a determination of fair rents in agriculture. The regulation of agricultural tenancies aims at establishing a progressive and self-supporting Burman peasantry.

A State Aid to Industries Act, designed to foster local enterprise by providing government help to new and nascent industries in Burma, received the Royal assent in November.

On October 10, the governor with the support of the ministry set up a Burma Defence Council to facilitate the development of the country's war effort.

Considerable trade expansion may be expected from the new Burma-China motor road, 770mi. long, from Lashio to Kunming in the province of Yunnan.

The road was completed early in 1939.

On Feb. 6, 1939 the King approved of a new national flag for Burma in recognition of its position as a unit of the Empire.

Education.—In 1938: total number of schools 26,073; scholars 778,682; primary schools 5,125; scholars 330,056; middle 1,005; scholars 131,883; high 365; scholars 85,611; special 1,142; scholars 18,257; unrecognized institutions 18,436; scholars 212,975; university, Rangoon, 2,121 students; arts college, Mandalay, 109 students.

Finance.—Revenue (est. 1939-40) Rs.15,43,23,000; expenditure (est. 1939-40) Rs.15,42,08,000; public debt (to India, to be funded in 43 years by an annuity of Rs.2,24,55,964) Rs.49,72,86,558; exchange rate Rupee (Rs.1)=1s.6d.

Trade and Communication.—Overseas trade (merchandise) 1938: imports Rs.20,77,79,000; exports Rs.47,80,96,000; re-exports Rs. 69,27,000. Communications 1939: roads, suitable for motor traffic, all-weather 6,263mi.; seasonal 6,280mi.; Railways, open to traffic 2,060mi.; inland waterways (approx.) 1,300 miles.

Agriculture, Manufactures, Mineral Production.—Production 1938-39 (in metric tons): rice 6,072,696; petroleum, crude (1938) 1,096,000; ground nuts 183,000; sesamum 53,000; maize 47,000; cotton, ginned 19,000; tobacco 45,000; silver (1938) 184.

Busch, Germán (1904-1939), Bolivian statesman and soldier, was born March 23 in the department of Santa Cruz. He attended military school at La Paz and was commissioned second lieutenant in 1922. As a captain of cavalry during the early part of the Gran Chaco war, he was cited several times for distinguished bravery under fire, and later he was advanced to commander of the cavalry and finally chief of the Bolivian general staff. When David Toro, the provisional president, resigned at the demand of the army July 13, 1937, Busch, who was then 33 years old and a national hero, assumed the provisional presidency. His administration at first had all the earmarks of being unusually liberal. He abolished censorship and promised early national elections, though he refused to rescind the order of his predecessor which had nationalized the petroleum concessions of the Standard Oil company of New Jersey in south-eastern Bolivia. In 1938 he brought the long controversy with Paraguay over the Chaco region to a peaceful conclusion. On April 24, 1939 he suddenly dismissed congress, suspended the constitution and all the courts, and took over dictatorial control of the country. Four months later, on August 23, he died in La Paz of a gun-shot wound which, according to the ministry of propaganda, was self-inflicted.

Buses, Motor: see ELECTRIC TRANSPORTATION; MOTOR TRANSPORTATION; MOTOR VEHICLES.

Business Cycles: see FINANCIAL REVIEW.

Butler, Pierce (1866-1939), American jurist, was born near St. Paul, Minn. on March 17 and received his bachelor's degree in 1887 from Carleton college, Northfield, Minnesota. He was admitted to the Minnesota bar in 1888 and practised law in St. Paul until 1923. President Harding nominated him associate justice of the U.S. Supreme Court Nov. 23, 1922; he was confirmed by the Senate the next month and took his seat Jan. 2, 1923. He was an outstanding conservative on the Supreme Court bench and although a Democrat voted consistently to annul legislation of the New Deal. Justice Butler died at Washington, D.C. on November 16.

Butter. As a direct result of increased industrial activity and an indirect result of war, prices for spot butter on the Chicago Mercantile exchange advanced from an inactive level of about 23½ cents a pound in August to 30¼ cents in the first 11 weeks of the war. The advance caused cessation of Government operations to peg butter around 24 cents by means of loans to the co-operatives' Dairy Products Marketing Association. United States foreign trade in butter has always been negligible. Even the greatly expanded exports of 1918 were only about 2% of production. The British Food Ministry on September 25 announced a maximum price of 27.3 cents a pound that importers might charge wholesalers in the United Kingdom for butter. Later it was announced that a butter ration of 4oz. per person per week would subsequently be put into effect. This is the same butter ration that had been in effect in Germany some months. Butter stocks in the United Kingdom at the outbreak of war were 65,579,000lb., approximately a three-weeks' supply and compared to 74,125,000lb. a year earlier. Nevertheless, United Kingdom imports from the Continent were further reduced. The United Kingdom imported 634,518,000lb. the first seven months of 1939; and 663,073,000lb. for the like period in 1938.

Stocks of creamery butter in the United States October 1, the peak of the storage season, were 155,000,000lb. in 1939, and 211,000,000lb. in 1938, a record in storage accumulations owing to DPMA storing 115,000,000lb. by means of a Government loan of about \$32,000,000. The DPMA attempted to fix prices at around

30 cents in 1938, but failed, and the accumulation was transferred to the Federal Surplus Commodity Corporation to distribute through relief channels. On July 26, 1939, the Government authorized a \$6,000,000 loan to the DPMA, to buy up to 25,000,000 pounds. Between July 29 and September 9, the DPMA accumulated 12,117,705 pounds.

On November 1 the DPMA and the FSCC had 21,228,000lb. in storage. Production of creamery butter in the United States from January 1 to September 30 was 1,406,388,000lb. in 1939 and 1,410,537,000lb. in 1938.

In Canada stocks of creamery butter November 1 were 56,203,773lb. in 1939 and 62,829,604lb. in 1938. Production in Canada from Jan. to Oct. 1939, was 239,399,939lb., a decrease of 0.7% from the same period in 1938.

War and Peacetime Butter Exports of the United States

Average Yearly	Lb.	Average Yearly	Lb.
1910-14	4,277,000	1918	26,194,000
1915	17,943,000	1919	34,556,000
1916	26,561,000	1934-38	1,153,000
1917	7,193,000		

(S. O. R.)

Cabinet Members. The following members of President Roosevelt's cabinet held office on Jan. 1, 1940:

Post	Name	State
Secretary of State	Cordell Hull	Tennessee
Secretary of the Treasury	Henry Morgenthau, Jr.	New York
Secretary of War	Harry H. Woodring	Kansas
Attorney-General	Frank Murphy*	Michigan
Postmaster General	James A. Farley	New York
Secretary of the Navy	Charles Edison**	New Jersey
Secretary of the Interior	Harold L. Ickes	Illinois
Secretary of Agriculture	Henry A. Wallace	Iowa
Secretary of Commerce	Harry L. Hopkins	Iowa
Secretary of Labor	Frances Perkins	New York

*Succeeded by Robert H. Jackson of New York, who was nominated Jan. 4, 1940.

**Sworn in Jan. 2, 1940.

Great Britain.—The following changes were made in the British Cabinet during 1939, up to the outbreak of war in September:—

On January 28 Sir Thomas Inskip became Dominions Secretary, being succeeded on September 3 by Mr. Anthony Eden, who had special access to the War Cabinet. Lord Chatfield, Minister for Co-ordination of Defence; Sir Reginald Dorman-Smith, Minister of Agriculture and Fisheries; and Mr. W. S. Morrison, Chancellor of the Duchy of Lancaster. On April 20 Mr. Leslie Burgin was created Minister of Supply, and was succeeded as Minister of Transport on April 21 by Capt. Euan Wallace.

Immediately upon the declaration of war against Germany on September 3, a War Cabinet was constituted as follows:—

Prime Minister and First Lord of the Treasury, Mr. Neville Chamberlain;
 Chancellor of the Exchequer, Sir John Simon;
 Secretary of State for Foreign Affairs, Viscount Halifax;
 Minister for the Co-ordination of Defence, Admiral of the Fleet Lord Chatfield;
 First Lord of the Admiralty, Mr. Winston S. Churchill;
 Secretary of State for War, Mr. L. Hore-Belisha*;
 Secretary of State for Air, Sir Kingsley Wood;
 Lord Privy Seal, Sir Samuel Hoare;
 Minister without Portfolio, Lord Hankey.

*Resigned Jan. 5, 1940; succeeded by Mr. Oliver Stanley.

Cabot, Richard Clarke (1868-1939), American physician and author, was born in Brookline, Mass., on May 21 and was educated at Noble's school and at Harvard university, where he received his M.D. degree in 1892. In 1894 he established his medical practice in Boston, where he lived the rest of his life. In 1899 he joined the staff of the Harvard Medical school, where he was professor of clinical medicine from 1919 until 1933. Dr. Cabot was a lifelong student of philosophy and social ethics. In 1903 and 1904 he lectured before Prof. Josiah Royce's seminar in logic, and he was professor of social ethics at Harvard from 1920 to 1934. He early brought

his interest in social problems to bear upon the question of socialized medicine, and he was one of the first in the United States to argue the practicability of group medical service. Frequently censured, he in his turn criticized the medical profession as reactionary and expensive for the ordinary patient. From 1912 to 1921 he was chief of staff of the Massachusetts General hospital, where he established a procedure for treatment of needy patients that was later adopted by hospitals all over the nation. Besides several volumes on diagnosis and medical case teaching, he was the author of *What Men Live By* (1914), *Adventures on the Borderlands of Ethics* (1926) and *The Meaning of Right and Wrong* (1933). He died at Boston on May 8.

Caldecott Medal: see AMERICAN LIBRARY ASSOCIATION; CHILDREN'S BOOKS.

Calendar of Events, 1939: see pages 1-18.

California, Pacific coast State of the United States, and thirty-first State to enter the Union (Sept. 9, 1850), is popularly known as "The Golden State"; area, 155,652 sq.mi., population (U.S. census, 1930) 5,677,251, California Taxpayers Association estimate, Jan. 1, 1940, 7,100,000. Capital, Sacramento, 93,750. Cities larger than Sacramento (1930) were: Los Angeles, 1,238,048; San Francisco, 634,394; Oakland, 248,063; San Diego, 147,995; Long Beach, 142,032.

Of the State's population, 4,160,596 were urban, or 73.3%; 5,040,247 whites; 97,456 Japanese; 81,048 Negro; 37,361 Chinese; 4,603,287 native born; 1,073,964 foreign born.

History.—Culbert L. Olson, California's first Democratic governor in 44 years, was inaugurated Jan. 2, 1939. Five days later he suffered a collapse, brought on by the strain of a hectic campaign and inaugural ceremonies, and for some weeks was unable actively to prosecute the duties of his office. Upon his recovery, Governor Olson faced a hostile legislature, which, throughout a record-breaking session of 133 days, consistently balked his liberal program. The Republican Senate and an Assembly with a scant Democratic majority slashed some \$91,000,000 from the Olson budget, including a \$71,000,000 relief item, for which was later substituted a \$35,525,000 temporary appropriation, to last until early 1940. The revised budget, totalling \$468,071,624 for the 1939-41 biennium, was still the largest in State history. Despite the mounting treasury deficit and the unbalanced budget, the legislature rejected the governor's entire new taxation program, except for a tax on gifts. Also repudiated was a pet Olson project involving a grant of \$170,000,000 to municipalities for distribution of electric power to be generated at Shasta dam. During the latter part of the session, State police were employed to round up missing representatives and barricade the halls against utility lobbyists. With the defeat of his recommendations by the 1939 legislature, Governor Olson called a special session for Jan. 29, 1940. The political scene was further enlivened by the special election of November 7. A revised "Thirty Dollars Every Thursday" pension scheme, again on the ballot after its 5-to-4 defeat in 1938, was this time repudiated 2-to-1, after a hot campaign. A measure for petroleum conservation, passed by the legislature and endorsed by the United States Navy, the C.I.O., and Democratic and Republican leaders, also was defeated, with a large negative vote in the oil-producing south serving to overcome the affirmative majority in the north. Two measures limiting interest on small loans were the only ones approved. As regards municipal elections, Los Angeles voters carried on the purge of city politics begun by reform Mayor Fletcher Bowron in 1938, and, in San Francisco, conservative Mayor Angelo J. Rossi retained his office by a scant margin over liberal Congressman Franck R. Havenner.

Although the 1938 probe of lobbying in the State legislature

failed to bring the repercussions anticipated, the Los Angeles reform movement continued, and, in March, Joseph Shaw, brother and secretary of former mayor Frank L. Shaw, was convicted, along with Civil Service Commissioner William Cormack, on 63 counts of selling civil service jobs. Graft allegations brought the indictment of William G. Bonelli, member of the State Board of Equalization, while formal charges were filed against the State Prison board for alleged mass floggings at San Quentin prison.

Labour troubles were most pronounced in the maritime industry, and especially in San Francisco, where, in November, earlier sporadic disturbances culminated in a general longshoremen's strike, which ended after 53 days with an agreement to negotiate differences. Crux of the difficulties on San Francisco's waterfront (according to the city's business leaders) was Pacific Coast Longshoremen leader Harry Bridges; in the summer he was the central figure in a nine-weeks' hearing on Angel island, in which the Government, enthusiastically supported by employer and other conservative interests, vainly sought his deportation as a Communist and undesirable alien. Another development with labour implications was the pardon, early in January, of Thomas J. Mooney, who had served 22 years for the San Francisco Preparedness Day bombing of 1916; Warren K. Billings, Mooney co-defendant, was released later in the year.

Government construction projects made rapid headway. On November 5, ground was broken for the \$14,000,000 Friant dam, on the upper San Joaquin river, while the pouring of concrete for Shasta dam was expected to begin early in 1940. Friant dam, the second major unit of the \$170,000,000 Central valley project, will be the fifth largest masonry dam in the world. Interurban railway service across the San Francisco bay bridge began in Jan. 1939, and the \$50,000,000 Golden Gate International Exposition, open 254 days, drew 10,496,203 visitors. The fair, although it closed with a \$4,600,000 deficit, was to re-open for four months in 1940.

Education.—In education, California maintained its high position. The University of California continued to be rated with Harvard and Columbia as one of the country's leading universities. With a physical plant valued at over \$50,000,000, assets exceeding \$70,000,000, and an operating budget of \$12,938,736 for 1939-40 (63.1% received from the State), the university led the nation in full-time enrolment (26,004 in the fall semester 1939). The well-developed public school system, buttressing the university, was allotted nearly \$77,000,000 by the State for 1939-41.

Charities.—Despite large Federal contributions and the new unemployment reserves benefits, State direct relief expenditures rapidly mounted, and in late 1939 were running at about \$4,000,000 monthly, with additional county expenditures of approximately \$6,000,000. Largely responsible for the increase was the influx of migratory workers, of whom 332,526 entered the State between Jan. 1, 1936 and Sept. 30, 1939. During 1938-39 the expenditure for unemployment relief, exclusive of unemployment reserves benefits and county relief, was \$119,802,769 (\$42,047,590 State, \$77,755,179 Federal). The case load on June 30, 1939 (again omitting counties) was 174,930 (about 24% Mexican), representing some 575,000 individuals (approximately 8% of the State's population). In November, there were 134,010 aged, 6,796 blind, and 39,125 children receiving categorical aids. Relief innovations during the year were the adoption in San Francisco of the Federal food-stamp plan, whereby surplus commodities are sold at reduced prices, and the inauguration in Los Angeles of the first unit of Governor Olson's "production-for-use" relief program.

Finance and Banking.—State Government costs for the fiscal year ending June 30, 1939 reached a record high of \$279,284,297, 7.6% greater than the 1938, and more than double the 1933 figure. Primary factors in this increase were the State's assumption of additional educational burdens and the skyrocketing of relief needs.

The cumulative general fund deficit as of June 30 was \$76,328,554, including a \$44,746,926 carry-over from previous *biennia*. Unless revenues increased, the State finance department predicted a deficit of over \$100,000,000 by June 30, 1941. Bank debits from 15 cities regularly submitting Federal Reserve reports were \$25,558,925,000, as compared with \$24,904,593,000 in 1938. On Oct. 2, 1939, there were 228 banks (128 State, 100 national), with a capital stock of \$202,722,000, capital funds of \$429,453,000, deposits of \$4,215,023,000, and total resources of \$4,702,828,000. The year's most sensational development in California banking occurred when the State took over management of the \$50,000,000 Pacific States Saving and Loan Company, whose president, Robert S. Odell, was indicted on charges of conspiracy and mail fraud.

Agriculture, Manufactures.—Business activity showed a marked advance in Nov.-Dec. 1939, spurred by the European war and the repudiation of the "Ham and Eggs" pension bill at the polls. The production value in basic industries for the year as a whole, however, remained approximately the same as in 1938, when the figure was \$1,930,000,000 (16% less than 1937); manufacturing accounted for about 44% (value added), agriculture 29%, mining 16%, motion pictures 8% (cost of production), lumbering 2%, and fisheries 1%. Gross farm income (including Federal payments, which increased 75% in 1939) approximated the 1938 figure of \$540,000,000. Manufacturing was sharply accelerated in the latter half of the year, showing at least a 7% increase in monthly average employment and aggregate payroll. Production values in mining advanced moderately, except for petroleum, which declined 11%, largely because of the voluntary curtailment of output by producers. Imports were \$117,129,000 for the first 11 months (compared with \$96,640,951 in 1938); exports aggregated \$253,216,671 (compared with \$259,807,439 in 1938).

(C. E. CH.; R. H. SH.)

California, University of. The most important event of the year at the University of California was the granting of an increased budget by the State Legislature for the biennium 1939-41. This budget, while below the minimum asked for, amounted to \$8,165,540, and has relieved some of the financial difficulties of the institution. This State budget represents 63.1% of the total budget of the university. Further relief from the problems of a steadily increasing student registration, which mounted to 27,511 in the year closing June 30, 1939, was afforded by PWA grants from the Federal Government for the first wing of a Life Sciences building on the Los Angeles campus of the university, and for a new library and administration building on the Davis campus. PWA funds were also secured to help in the construction of a new home for the University of California Press at Berkeley. These buildings will all be occupied by the spring of 1940.

Various major administrative and curricular changes have been consummated during the year 1939, including the splitting of the Teachers college into a School of Education and a College of Applied Arts, and the addition of three new fields of study for the Doctor of Philosophy degree on the Los Angeles campus; the establishing of a separate department of social welfare, and a department of journalism on the Berkeley campus; and the concentrating of various technical courses in nutrition, etc., into a division of home economics, functioning both at Berkeley and on the Davis campus. The experiment of offering a general course on family relations was also started on the Berkeley campus in the fall of 1939. The College of Pharmacy at the Medical Center in San Francisco completed its first year under the new plan of requiring four years of college work for a degree, and of offering graduate instruction for those desiring it. A number of laboratories were completed, including the radiation laboratory at

Berkeley, a poultry disease laboratory at Davis, a bubonic plague laboratory at the Medical Center, etc.

Gifts to the seven campuses of the university for the year ending June 30, 1939, totalled \$1,881,872.62. A greater number of distinguished scholars were added to the faculty than in any year of the past decade.

(R. G. S.)

Calinescu, Armand (1893-1939), Rumanian statesman. Son of a Rumanian army officer and landholder, he was born May 22 at Pitesti, and was educated at the University of Bucharest, where he received his law degree, and at Paris, where he received a doctorate in political science. He established a legal practice in his native town and shortly entered politics as a prefect of his county and as an organizer for the National Peasant party, which had been established in 1926. A close student of agricultural economics, he was appointed secretary general of the ministry of agriculture and later was under secretary of interior. In Dec. 1937, Calinescu became minister of interior in the cabinet of Octavian Goga, and he retained this portfolio in Miron Cristea's cabinet in Feb. 1938, when King Carol demanded Goga's resignation. When Cristea's health failed, Calinescu was appointed vice-premier, and upon Cristea's death he became premier March 7, 1939. He was a bitter enemy of the pro-Nazi "All for Fatherland" party (Iron Guard) and waged a relentless war on its members. He was assassinated September 21 by Iron Guardists while driving through the streets of Bucharest. His successor as premier, Gen. George Argesanu, exacted a speedy revenge for the crime and executed not only the actual assassins and their co-plotters, but several hundred other Iron Guard leaders and sympathizers as well.

Cambodia: *see* FRENCH COLONIAL EMPIRE.

Cambridge University. During 1938-39 the number of matriculants was 1,936, the largest ever recorded except in 1919. The masterships of Christs and Clare fell vacant by retirement, and of Peterhouse by death. The chairs of ancient philosophy, political science, philosophy, and archaeology fell vacant and the last named has been filled by Miss D. A. E. Garrod, the first woman professor in the university.

Generous benefactions have been received by the Library, Fitzwilliam museum, an additional amount to the chair of naval history, and further endowments for scientific research.

The University Press has published the last volume of *Ancient History*, thus completing the various series dealing with the history of the Western world, suggested by Lord Acton.

A voluntary register of the qualifications and experience of its senior members was compiled by the university, so that on the outbreak of war the services of scientific and other specialists could be immediately used. Also a University Recruiting Board has been set up to select members for such war service for which each is equipped. The following colleges and departments of London university have been evacuated to different Cambridge colleges:—Bedford college, Queen Mary's college, St. Bartholomew's Medical school, London Hospital Medical school, London School of Economics, Bartlett School of Architecture and the School of Oriental and African Studies.

(C. Fo.)

Cameroons: *see* BRITISH WEST AFRICA.

Camp Fire Girls. Formulated in 1911 by Dr. and Mrs. Luther Gulick and a group of other educators as a program of leisure time activities for girls, the Camp Fire Girls organization was incorporated in 1912.

The revised program of the Camp Fire Girls, made in 1936 in

order to provide for a wider age range and to include current interests of the modern girl, continues to win and hold the interest of 'teen age girls.

There continues to be an increase in Blue Bird membership (the junior organization for girls eight and nine years old) both girls and leaders seeming to appreciate the program of creative play activities revised in 1938.

As a special project for 1939 the Camp Fire Girls explored Americana. They found out about the historical backgrounds of their communities, interviewing pioneers, visiting historical sites and collecting relics for exhibits.

There was a Camp Fire Girls' Day at each of the World's Fairs. At the New York World's Fair the girls challenged the Boy Scouts to a pancake baking contest—which they won. At the Golden Gate Exposition over 5,000 Camp Fire Girls gathered from nearby cities for an all day program.

There was an increase in all types of camping enjoyed by Camp Fire Girls: the summer sessions at the large organized camps, the camping trips of individual groups and the holiday and week-end camping throughout the year.

At 11 camps national training courses were well attended by group leaders, and in addition leaders received training in courses given by local Camp Fire executives in 145 cities.

The Honourable Franklin D. Roosevelt is honorary president of the organization, and Mrs. Roosevelt is honorary chairman of the advisory committee. The following national officers were re-elected at the meeting of the National Council, held in Berkeley, Calif., in Oct. 1939: Mrs. Elbert Williams, president; Edgar Webb, treasurer; Lester F. Scott, secretary and national executive. Her Highness Princess Marie Louise is patroness of the British Camp Fire Girls, and Lady (Walter) Hearn is president.

(C. F. Lo.)

Canada. Canada, a self-governing British dominion of North America; capital, Ottawa; governor general, Lord Tweedsmuir; prime minister, W. L. Mackenzie King; area, 3,729,665 sq.mi.; pop. (census of 1931) 10,376,786, estimated (Jan. 1, 1940) 11,367,000.

History.—The Dominion continued under the administration of the Liberal Party with Mr. Mackenzie King as prime minister, elected to power Oct. 14, 1935. Unless sooner dissolved, parliament expires in five years and consequently general elections will be held in 1940. The term of the governor general also expires in the current year. The press has already spoken freely of Lord Elgin, grandson of a former governor general of Canada as his probable successor.

Among the important official and diplomatic changes of the Federal Government, may be mentioned the retirement of the Hon. Philippe Roy, Canadian minister to France, succeeded by Col. George P. Venier. On September 15 Loring C. Christie was appointed Canadian minister to Washington. Jean Desy, the first Canadian minister to Belgium and Holland, was received by King Leopold of Belgium (February 4). L. W. Brockington, retiring from the chairmanship of the Canadian Broadcasting Corporation (December 21), was appointed Canadian official War Recorder.

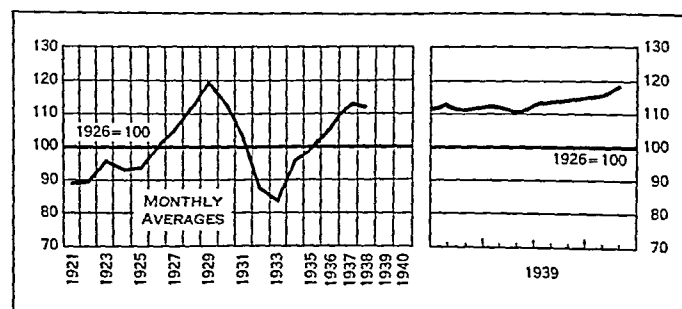
Inside the ministry itself Norman A. McLarty of Windsor, Ont. succeeded John C. Elliott as Post Master General (January 23). An important reorganization of the cabinet, as indicated below, was made after the outbreak of war. Among the parliamentary references and reports, great prominence attached to that of Justice H. N. Davis on the Bren Gun contract, tabled in the House of Commons. In the Canadian provinces, general elections were held in Prince Edward Island (May 18) where the Liberal administration under Thane Campbell was overwhelmingly returned to office (27 seats to 3 Conservative). Elections were held in Quebec (Oc-

tober 21) in which the National Union Government of Mr. Duplessis, advocating extreme provincial autonomy, was utterly defeated, the Liberal Party obtaining 68 of the 86 seats in the Legislative Assembly. An administration of that party was formed under Adelard Godbout. On November 20, elections in New Brunswick returned to office the Liberal administration of A. A. Dystart, with 28 seats in the legislature Liberal and 20 Conservative.

Tour of the King and Queen.—A unique and striking feature of the history of the year was the visit to Canada of their Majesties King George VI and Queen Elizabeth, the first visit ever made to America by any reigning British sovereign. Their tour covered the breadth of the Dominion from the Atlantic to the Pacific. The visit, made directly by arrangement with His Majesty's ministers in Canada, inaugurated, both constitutionally and in the popular mind, the now accepted status of Canada as one of the equal associates in the British Commonwealth. Landing from the "Empress of Australia" at Quebec on May 17 their Majesties were received by the Prime Minister of Canada (the Rt. Hon. William Lyon Mackenzie King) and tendered a reception in the name of the Province of Quebec by the Legislative Assembly, with an official luncheon at the Chateau Frontenac. At Montreal their Majesties occupied a royal suite specially prepared at the Windsor hotel, where a civic banquet was offered in their honour (May 18). At Ottawa they were the guests of the governor general at Rideau Hall and received a welcome from the two Houses of Parliament. During the entire tour the entertainment of the King and Queen was official only, but the cheering crowds which everywhere thronged to greet them, and the gracious moments of unofficial intercourse given by the King and Queen, made the tour partake of the appearance of a vast personal welcome. At Toronto the Dionne quintuplets were presented to their Majesties and the Queen, as honorary Colonel, gave colours to the Toronto Highland regiment. Proceeding west from Toronto their Majesties stopped at Port Arthur and Fort William, Winnipeg, and Regina where they inspected the headquarters of the Royal Canadian Mounted Police. After seeing Moose Jaw and Calgary and spending a day in the mountains at Banff, the royal sovereigns, reached Vancouver (May 29) and Victoria (May 30). The return journey was made via Edmonton, Saskatoon, and Sudbury where the King and Queen made a descent into a nickel mine. Reaching Niagara on June 7 their Majesties entered the United States for a brief tour. (See ROOSEVELT, FRANKLIN DELANO; UNITED STATES.)

Returning to Canada (June 12) they passed via the eastern townships of Quebec to Fredericton, N.B. Leaving New Brunswick on the Canadian destroyer "Skena" they crossed to Charlottetown, P.E.I., and thence to Halifax. Leaving Halifax on the "Empress of Britain" their Majesties touched at Newfoundland and reached Southampton on June 22.

Outbreak of War.—(See EUROPEAN WAR.) In Canada there was no doubt from the first that the Dominion would participate in



EMPLOYMENT IN CANADA: index as of first of month, adjusted for seasonal variation. Compiled by Dominion Bureau of Statistics from reports from representative establishments, including construction and maintenance, manufacturing, mining, service, trade, and transportation

¹Died Feb. 11, 1940.

any war involving Britain. The ministry took no direct part in negotiations with Germany but expressed, at the height of the crisis, their entire acquiescence in the British attitude. War began for Britain on September 3, for Canada it did not legally begin till September 10. When the King's declaration of war was proclaimed the Dominion Executive Government at once expressed its adherence to British policy but could not declare war without a summons of parliament, not then in session. The war session began on September 7. The overwhelming vote in approval of the Speech from the Throne (September 9) warranted a declaration of war which was issued as a royal proclamation by the governor general in the following terms: "Now therefore we do hereby declare and proclaim that a state of war with the German Reich exists and has existed in our Dominion of Canada as from the tenth day of September 1939."

Even before the parliament met, the Government had adopted special war measures by reviving under Order in Council the War Measures Act of 1914 which clothes the Executive Government with dictatorial power to do anything immediately necessitated by the state of war. During the ensuing war session, a series of Acts of Parliament supplemented these emergency powers. A War-Time Prices and Trade Board was set-up, composed of three persons appointed during the pleasure of the Crown with power to investigate prices, costs, and stocks of goods; to assign maximum prices and to punish hoarding and monopoly. The Act carries penalties of \$5,000 or two years in jail or both. Special war taxes were enacted by amendment of the Customs, Excise and Income Tax Acts, and a special excess profits tax. A further act established a department of munitions and supply. The Cabinet was reorganized by a shift of portfolios on September 19. Norman M. Rogers left the Labour department to become minister of National Defence, Norman McLarty moving to Labour from the Post Office which was taken over by C. G. Power. The Hon. Ian Macenzie, formerly minister of National Defence, became minister of Pensions, and Colonel J. L. Ralston succeeded C. A. Dunning whose condition of health necessitated his relinquishing the portfolio of Finance.

The opening of the war closed down a veil of official secrecy on all movements of troops and of all arrivals and departures of ships at the Canadian seaports. Parliament authorized (September 19) a Canadian active service force to be initiated with two divisions, and placed at the head of it Brigadier General Andrew McNaughton (*q.v.*). A first division was to proceed overseas by contingents. No public announcement was made of its personnel or of the time of its departure. It was understood that the major part of the force had reached England at the end of the year. Meantime the Permanent Militia (standing army of Canada) was recruited to full strength and expanded by new enlistment, with an obligation to go overseas as required.

Economic Life of Canada.—The economic life of the Dominion of Canada was so profoundly affected by the outbreak of war with Germany in the beginning of September that the first eight months of the year 1939 must be entirely differentiated from the period that follows. Any economic statistics computed for the year as an annual total or as a monthly average over 12 months, necessarily contains a misleading element. It is also necessary to remember that much information of what has happened since September 3 is officially withheld, and that a large part of the financial life of the country has passed under the restriction of exchange control.

Of the first eight months of the year it may be said that the period represents in general the further continuance of the constant, if arduous, emergence from the great depression of the opening decade. The estimates for field crops, volume and value, as analyzed by the Hon. James C. Gardiner, minister of Agricul-

ture, Ottawa, show that Canadian agriculture was in a better position at the close of the year 1939 than it has been for several years. The gross value of field crops is placed at \$635,764,000. more than \$91,000,000 over the figures of 1938 and constituting the record since 1930. Wheat especially shows an advance, with a crop of 478,965,000bu., second only to the banner crop of 566,726,000bu. in 1928.

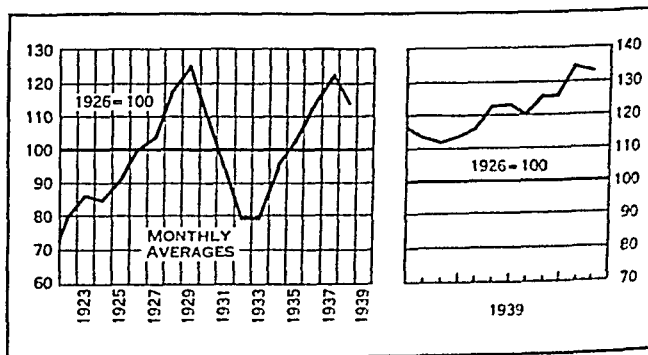
The livestock industry has also showed a forward movement. The estimates made by the Department of Agriculture (Ottawa) indicate that the cessation of the great drought and the heavy crops of 1938 had brought an increasing supply of livestock, as calculated in the summer of 1939 for autumn and winter slaughter. Stock thus due for market showed in 1939, 2,209,000 hogs as against 1,779,000 in 1938, and 1,496,000 cattle as against 1,362,000. The closing of the vast war contracts for meat supplies will carry this movement forward into 1940.

In regard to the manufacturing industries of Canada of 1939, it may be said that the total industrial production of Canada in the first half of 1939 showed a certain, but not great recession. In the steel industry this decline represented as much as 14% below 1938, but was counterbalanced by the rapid expansion that followed the opening of the war. The month of December showed a wide margin of advance over the two previous years. The automotive industry may be said to have held its own. Motor vehicles purchased in September (6,755, value \$7,626,227) were in advance of the preceding year (5,710). The great advance in the aircraft industry is discussed in the section *War Finance and Industry*. In textiles, the cotton industry opened to what seemed a lean year. Mills were on short time for the opening months. Two large companies, Canadian Cottons and Dominion Textiles, closed their fiscal years on March 31 with earnings short of common dividend requirements. After June the situation improved. The United States was restricting production, Lancashire, owing to a brisk home demand, exporting less. War conditions (transport and the U.S. premium) gave a new stimulus to Canadian mills. In general terms it may be said that manufacture in Canada (Jan. 1-Sept. 1, 1939) was at best holding its own, but the war has greatly speeded up the steel, paper, and metal industries and aided most others.

(S. LEA.)

War Finance and Industry.—In Canadian financial circles the outbreak of the war in September was taken calmly. There was no closing of stock exchanges, no public hysteria, no wholesale liquidation of securities, and no strain on the banks or other financial institutions. This quiet confidence continued to manifest itself throughout the year.

Canada, as other nations, had already abandoned the gold standard so there was no need to take this step, but to protect the external value of the dollar an Exchange Control Board was set up. By order of this board no more than \$100 may be taken or sent out of Canada by any person in any one month without a spe-



PHYSICAL VOLUME OF BUSINESS in Canada: combined index of industrial production and distribution. Compiled by Dominion Bureau of Statistics

cial licence. The purpose of this is to retain capital in Canada and to prevent speculation in foreign exchange, but the order is in no way intended to restrict international trade.

At the special session of Parliament (September 7-13) to meet the extraordinary expenditures necessarily arising when a country is at war, a supplementary budget was introduced to secure additional revenue. The ordinary budget of April 1939 had anticipated a revenue of \$490,000,000 and an expenditure of \$550,000,000, involving thus a deficit of some \$60,000,000. This was for the fiscal year (March 31, 1939-April 1, 1940), exclusive of certain defence expenditures, capitalized under a special sinking fund plan, and of any losses arising out of the guarantee of 70¢ a bushel for wheat.

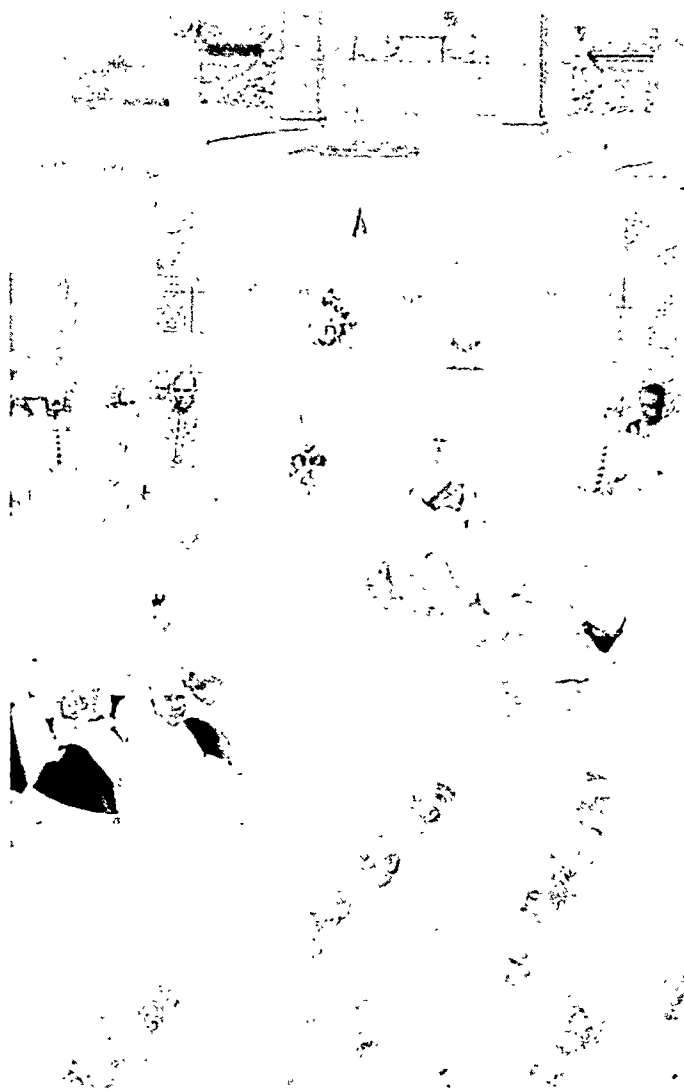
When the war budget was introduced it was estimated by the Acting Minister of Finance, J. L. Ilsley, that there would be an increase of \$5,000,000 over the April figure in ordinary revenue for the year, owing to the placing of substantial war orders (*see below*). Against this there was the new authorized expenditure of \$100,000,000 for war purposes. Including this amount, the expenditures for the year were expected to reach \$651,000,000 as compared with a revenue of \$495,000,000, leaving a deficit of \$156,000,000. To meet this deficit the Federal Parliament voted new taxes and increases in certain existing taxes.

Among the new taxes is the excess profits tax on all businesses whether incorporated or not. This provides for a tax on one of two bases (the choice lies with the taxpayer), either on the basis of a graduated scale of rates of profit on capital employed or on the increase in profits over the average of the past four years. Where the tax is levied on the rates of profit on capital employed, it ranges from a minimum of 10% on profits in excess of 5% and not exceeding 10% on such capital. Where the tax is levied on profits in excess of the average annual profits for the past four years it is 50% of such excess profits. This tax is in addition to all other taxes.

The ordinary corporation income tax is increased by 3%, thus providing for additional revenue in any case. All individuals subject to income tax are required to pay a surtax equal to 20% of their ordinary income tax. In the field of indirect taxation, the excise tax on liquors and brandy, imported or domestic, has been increased by \$3 per gallon, on wines 7½¢, and on cigarettes \$1 a thousand. Beer and non-alcoholic drinks are taxed through increased levies on the raw materials of manufacture. The customs tariff on tea and coffee has been increased.

It is difficult to estimate at this time how much these additional taxes will yield, and hence how close they will come to meeting current expenditure. In the meantime (Oct. 12, 1939) the Government floated a war loan for \$200,000,000. This was fully subscribed at par by the chartered banks of Canada. A domestic loan, similar to those of 1914-18, is planned for 1940.

Industry under War.—The effect of the war on Canadian industry has not been as great as was anticipated. Estimates of the volume of munition equipment orders from the Government of the United Kingdom, and the rapidity with which they would be placed, were not fulfilled, largely because existing overseas supplies were adequate for the type of warfare that was being fought, and, for diplomatic reasons, some orders were placed with neutral European countries. However, the repeated assurances that the Government of the United Kingdom will buy extensively from Canadian manufacturers appears at the end of this year (1939) to hold. In October the Government of the United Kingdom contracted for a year with seven of the mining companies of Canada for 80% of their current output of electrolytic copper, which amounts to about 420,000,000 pounds. The agreement is subject to renewal for the duration of the war. In the following month (November) all Canadian exports of lead and zinc were placed



KING GEORGE and Queen Elizabeth enthroned in the Canadian Parliament at Ottawa May 19, 1939

under exclusive contract, for the use of Great Britain for the duration of the war. Exports of lead and zinc in 1938 amounted to \$30,000,000, but war requirements will call for greater supplies. In December these two orders were supplemented by a contract for a weekly supply of 4,480,000lb. of Canadian bacon and up to 5,600,000, if deliveries can be made, at \$20.18 per English cwt. at the Canadian seaboard. A Federal Bacon Marketing Board has been set up to control the price of bacon in the domestic market.

Industry has also been aided by orders for war materials from the Government of Canada. Up to the end of the year the Canadian War Supply Board had let contracts totalling \$54,000,000. For 1940 increased industrial activity is assured through the operation of the Commonwealth air training plan. The final agreement was signed in Dec. 1939. The agreement makes provision for the training of many thousands of aeroplane pilots, requiring a staff of 40,000 men for the 67 training schools which are to be established. A large amount of work will be necessary in constructing the 60 new air fields, and in improving existing fields, as well as in making equipment. The agreement runs for 3½ years, to be extended if necessary, and the estimated cost for this period is \$600,000,000, with Canada contributing as her share \$350,000,000. The estimated expenditure on the plan up to Sept. 1, 1940 is \$90,000,000, of which Canada will contribute \$48,000,000. This is in addition to the estimate of the minister of Finance of \$315,000,000 for the first year's cost of the military program. Canada in 1940 will be spending \$1,000,000 a day on war effort.

The steel industry was affected immediately by the outbreak of war, which precipitated buying in anticipation of a possible shortage or of a price increase. After losing ground in the first half of the year, when production declined 14%, increased activity in the second six months resulted in an output for the full year of approximately 1,375,000 long tons, a marked gain over 1938 and almost equalling the post war record year of 1937.

In civil aviation there was marked progress during 1939. The Trans-Canada Air Lines service, inaugurated in 1937, has developed rapidly. The mail service between Vancouver and Winnipeg was extended to Toronto, Ottawa, and Montreal on an overnight basis at the beginning of March 1939, and on April 1 passenger service was begun between these points. On July 18, 1939, an additional service was established between Montreal, Ottawa, and Toronto. With the further extension of mail and express service to Moncton on November 1, the Air Lines became Trans-Canada in fact as well as in name. The Trans-Canada Air Lines fleet now consists of 15 Super Electras which make the Vancouver-Montreal trip in 15hr. including stops and the Montreal-Moncton lap in 2½hr., the whole route covering nearly 3,500 miles. The potential value of the T.C.A. services was emphasized by the inauguration, in August, of Imperial Airways transatlantic mail service, when British mail was received in Vancouver only 54hr. after leaving Southampton. The experimental flights of the transatlantic service were discontinued for the winter season. The Trans-Canada Air Lines from its beginning up to Sept. 1, 1939 has flown 3,853,243 revenue miles, carried 13,583 passengers, 645,400lb. of mail, and 33,103lb. of express.

Railway statistics reflect the increased industrial activity during the latter part of the year. Canadian railways earned \$42,960,066 in September compared with \$34,504,187 a year ago. This was an increase of \$8,455,879 or 24.5%. Operating expenses increased by only \$2,651,568 and the operating income increased by \$5,674,076 or from \$6,374,816 in 1938 to \$12,048,892. For January-September gross revenues increased from \$237,533,359 in 1938 to \$253,709,429; operating expenses increased from \$222,468,159 to \$225,301,554, and the operating income from \$4,229,146 to \$17,146,147.

The latest statements of the chartered banks as at the end of October, showed commercial loans at their highest for seven years. They were placed at \$952,296,000, a gain of \$60,800,000 as compared with September, and of \$104,000,000 as compared with Oct. 1938. Bank debits to individual accounts in November were \$2,930,000,000 as compared with \$2,955,000,000, in Nov. 1938.

Overshadowing war expenditures as an impetus to business generally was the increased purchasing power of the farming community. The Dominion Bureau of Statistics estimates the value of the principal field crops for 1939 at \$635,764,000 an increase of \$91,321,000 over 1938.

It is too soon to judge how the repeal of the Neutrality Act of the United States will affect the war industries of Canada.

(J. T. C.)

Public Finance.—At the opening of the year the main estimates (given January 25) for the fiscal year April 1, 1939-40, totalled \$457,291,215, including \$63,435,176 for national defence. But as early as March 25 C. A. Dunning, the minister of Finance, forecast a budget deficit of \$60,000,000. For the first eight months, the pre-war period of 1939, the Federal revenue was \$354,713,180 as compared with \$358,408,250, in the preceding year. Expenditures amounted to \$374,449,127 as compared with \$335,496,039. The outbreak of war necessitated a reorganization of taxation and finance. (See section *War Finance and Industry*.)

Mineral Production.—The first nine months of 1939 showed a strong advance in mineral production in Canada. Dr. Charles Camsell, deputy minister of mines (Ottawa) stated in a communi-



"NO WALLS OF STEEL IN AMERICA." The visit of King George VI to North America in May and June 1939 inspired this cartoon by Seibel of *The Richmond Times-Dispatch*

cation to a leading Canadian journal that in all probability the year will show a new record in the value of gold and petroleum production and that the total value of mineral production will probably surpass the figure of \$441,823,237 reached in 1938. Gold produced in the first nine months of the year amounted to 3,803,202 fine ounces (3,464,308 in 1938); nickel, in pounds, 170,361,711 (160,097,162 in 1938). The production of asbestos was well ahead of that of 1938 but fell short of the record output of 410,000 tons in 1937.

Power Development.—Still more striking is the advance in the development of water power. The year 1939 showed great activity in the installation of new capacity and in the extension of transmission and distributing facilities. Each month in succession for the period ending October 31 showed an increase in the production of electrical energy over the year before, and the 10-month period averaged a 9% increase. Of the 97,040 h.p. increase of new installations the greater part (87,441) is made up of extensions in Saskatchewan, Ontario, and Quebec, largely due to the development of the mineral and paper industries.

External Trade.—In the pre-war period of 1939 Canadian external trade had shown a decided increase. Even with lower wholesale prices the exports of Canada were valued at \$823,905,000 in 11 months of 1939. Imports of merchandise showed \$595,000,000 as against \$569,000,000.

Labour and Employment.—Wages during the pre-war months of 1939 remained on the whole stationary, nor were there any wide or violent labour disputes during the year. The situation in regard to unemployment and public relief showed a certain betterment. The official Canadian index of industrial employment is based on returns from 11,856 firms (1939) employing 1,165,631 persons. The comparison made is with 1926 and shows an in-

crease from 100 to 119 for Sept. 1939 as compared with 115 a year before. On the other hand the same month in 1937 showed a figure of 123. These statistics, however, are of limited range, not including agriculture and other primary industries. The figures in regard to public relief make a better showing. Persons on direct unemployment relief throughout Canada totalled 541,500 in September, a decrease of 32% compared with the previous month and a decrease of 2.2% compared with the same period of 1938. A very real improvement showed in the matter of relief to farmers, the recipients numbering, with their dependents, 71,000, or a decrease of 34% from the year before.

Prices.—Prices in 1939, both as tabulated in the retail prices of weekly family budgets throughout Canada (*Labour Gazette of Canada*—monthly), and in the wholesale prices of general commodities (*Ibid.*), were moving very little in the first eight months of the year. The Canadian official calculation is made with 1926 as the basis of 100. The index at the outbreak of the war stood at 72.8 as compared with the high point; in retrospect, 164.3 for May 1920 and the low point 63.5 for Feb. 1933. (S. LEA.)

Canadian Literature. In contrast to 1938 when the field of "general literature" provided the better fare, 1939 was more noted for fiction. The psychological novel, now becoming less rare in Canada, dominates, and shows a salutary, though still mild awareness of the author's responsibility as an interpreter. Frederick Philip Grove, a veteran writer, suggests a new approach to problems of human relationships in *Two Generations*, a penetrating study of Ontario farm life during a period of social and economic dislocation. Miss Irene Baird's *Waste Heritage*, a bitter indictment of current labour injustices, is a *volte-face* from her pleasantly innocuous and popular earlier novel, *John*, but does not increase her reputation. The costume, refuge of mediocrity in recent years, gains fresh lustre in *The Champlain Road*, a tale of the Jesuit Missions in Huronia, by Franklin D. McDowell.

General literature provided less achievement. One notable book in that field is Mrs. L. G. Salverson's *Confessions of an Immigrant's Daughter*. Readable personal histories are a negligible factor in Canadian literature; but Mrs. Salverson, who won the governor-general's award for fiction in 1937, writes with a verve inherited from Viking ancestors, and increases the scanty store of good Canadian autobiography. The poetry of 1939 tends to progressiveness without recourse to too experimental metres. Supplemented by a pleasing freshness of interpretation, this trend is reflected in Miss Anne Marriott's *The Wind Our Enemy*, Alan Creighton's *Cross-Country*, and Arthur S. Bourinot's *Under the Sun*. All belong to the younger poetic generation.

The brightly edited *Canadian Bookman* has suspended publication, at least temporarily, but the *Canadian Poetry Magazine*, backed by the Canadian Authors' Association, survives and shines under the editorship of E. J. Pratt. The governor-general's awards for the best Canadian books published in 1938 went to Miss Gwethalyn Graham's *Swiss Sonata* (fiction), Kenneth Leslie's *By Stubborn Stars* (poetry), and John Murray Gibbon's *Canadian Mosaic* (general literature). (R. S. K.)

Canadian Medical Association. The Canadian Medical Association was organized in the city of Quebec on Oct. 10, 1867, and held its first meeting in Montreal on Sept. 2, 1868. Annual meetings have been held each year since, with the exception of 1915 and 1916. In 1921 the society underwent reorganization, and in 1925 was affiliated with the British Medical Association. A monthly journal, *The Canadian Medical Association Journal*, has been published since 1911. All the provincial medical societies are affiliated with

the association, and any licensed practitioner who is a member of a provincial society is eligible for membership. The present membership is over 4,000. (J. T. C.)

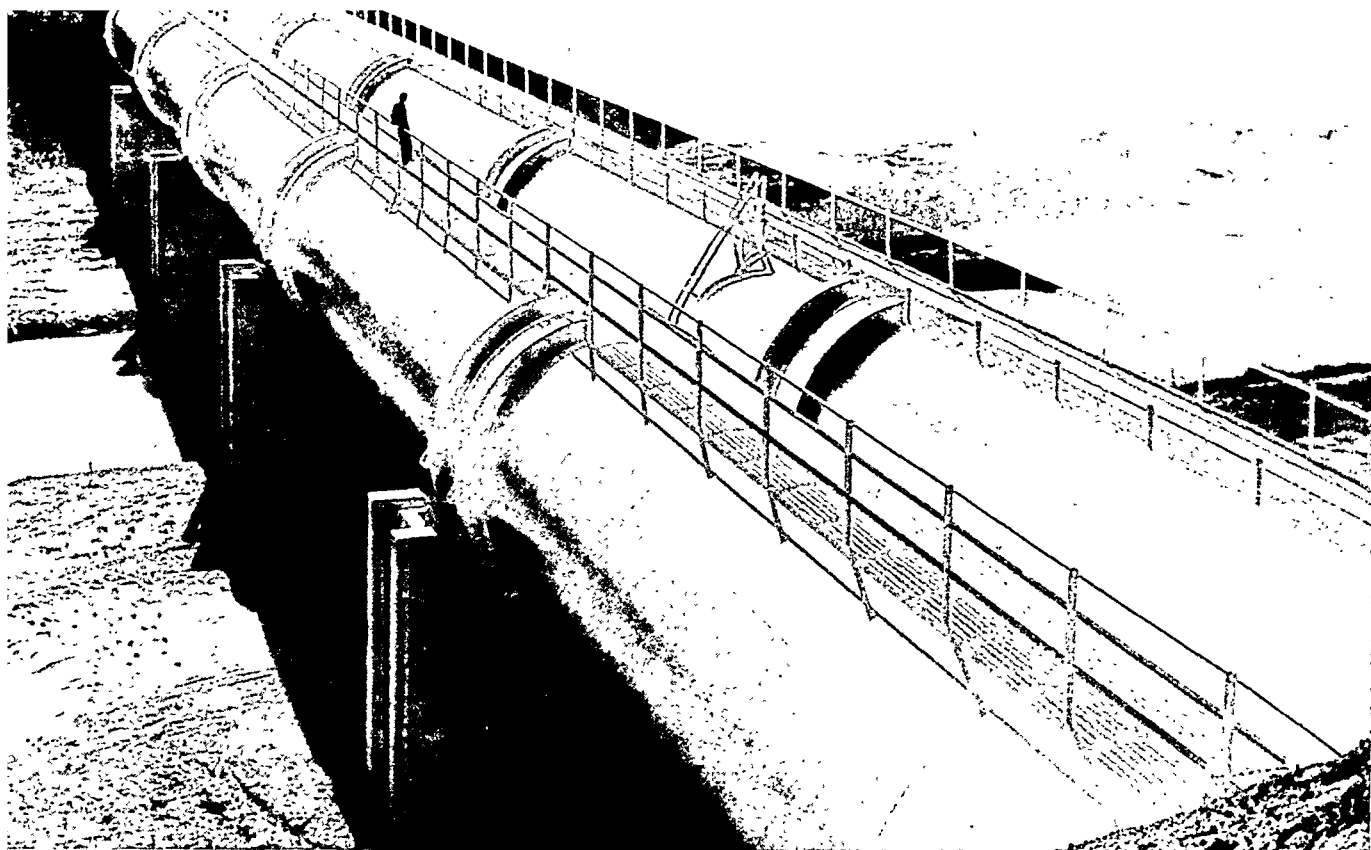
Canals and Inland Waterways. The principal inland navigable waters of the United States are the Great Lakes, the New York State canal system, the Mississippi river system, the Atlantic Intracoastal waterway, the Intracoastal waterway from St. Marks river in Florida to Corpus Christi, Tex., the San Joaquin-Sacramento system in California, and the Columbia system in the northwest. The Great Lakes have natural deep water except in the connecting channels, which have been artificially deepened where necessary to accommodate a draft of 24ft.; and the Welland Ship canal joining Lakes Erie and Ontario, as improved by Canada, has a permissible draft of 23.5feet. The 12-ft. New York State Barge canal is being deepened to 14ft. between the Hudson river and Lake Ontario at Oswego. The Atlantic Intracoastal waterway system between Trenton, N.J., and Wilmington, N.C., has been completed to project depths of not less than 12ft., and thence to Key Largo, Fla., 63mi. below Miami, with depths of from seven to ten feet. Deepening of the waterway to 12ft. between Wilmington, N.C., and St. Johns river, Fla., was in progress at the close of 1939. Dredging in Cape Cod canal to secure a channel width of not less than 500ft. and a depth of 32ft. at mean low water is actively in progress. The Chesapeake and Delaware canal has been dredged to 27 feet. On the Gulf coast, projects have been adopted to provide a protected Intracoastal Waterway not less than 9ft. in depth between St. Marks river, Fla., and Corpus Christi, Tex., more than 1,000mi., and this depth is available from Apalachicola to Galveston. Dredging of the waterway south of Galveston is in progress. The Mississippi has a 9-ft. depth from Baton Rouge to St. Louis, and work is well advanced to secure a 9-ft. channel thence to Minneapolis by the construction of a series of 26 locks and dams, the last of which, lock and dam No. 24 at Clarksville, Mo., will be completed by the 1940 navigation season.

Traffic on Major Canals and Inland Waterways of the U. S. for 1938

	Tons	Value
St. Clair Flats Canal	54,228,643	\$ 606,447,839
St. Marys Falls Canal	40,042,739	581,521,502
Mississippi River, Minneapolis to The Passes	28,851,756	1,169,836,878
Sabine-Neches Waterway	38,147,320	478,134,087
Houston Ship Channel	26,737,394	625,015,635
Ohio River	20,587,402	278,394,449
Monongahela River	15,327,885	75,232,230
Louisiana-Texas Intracoastal Waterway	6,589,933	141,331,321
New York Barge Canal	4,709,488	224,797,863
Cape Cod Canal	3,524,119	104,053,455
Chesapeake and Delaware Canal	2,234,149	149,739,480
New Orleans Navigation Canal	1,866,997	211,288,916

The total traffic of United States canals and waterways in 1938 was computed after eliminating all known duplications of traffic at 277,754,587 short tons, valued at \$5,657,886,608. (For statistics regarding the Panama canal see PANAMA CANAL AND CANAL ZONE. See also AQUEDUCTS.) (J. L. S.)

Great Britain.—Activities during 1939 in Great Britain in connection with the improvement of facilities for inland navigation have been practically confined to the carrying out by the recently established Catchment Boards of a series of regulation and improvement works on certain rivers within their respective jurisdictions. Notable among these, as in the previous year, has been the river Nene, in which important developments have taken place on various sections of the river from Wisbech to Northampton. Although still incomplete, sea-going vessels now make regular journeys as far as Peterborough and in the upper reaches there is a regular service of barges from the Midlands and London to points near Northampton and Wellingborough. Works have been in progress on other rivers, but more with the object of flood



TWO RIVERS, one natural and one artificial, intersect near Calexico, Calif., where the All-American canal bridges a stream

prevention than of facilitating navigation.

Belgium.—An outstanding event of the year on the continent of Europe was the practical completion in Belgium of the Albert canal, connecting the industrial town of Liège with the seaport of Antwerp. About 80 miles in length and with a capacity for barges of 2,000 tons, it was on the verge of an official opening in July, in association with the great Water Exhibition at Liège, when the unfortunate failure of a portion of the banks caused a temporary delay which has extended into the war period. The canal is intended to make Liège the distributing centre not only for Belgium, but also for the Grand Duchy of Luxembourg and parts of northern France.

France.—An important project, known as the "Canal des Deux Mers" designed to connect the Gironde estuary in the west with the Mediterranean near the town of Narbonne was revived for consideration in the early part of the year. A ship canal of the same calibre as the Panama and Suez canals, it would involve an outlay so considerable, that there is little probability of active measures being taken for some time after the restoration of peace conditions.

Germany.—The completion of the Mittel-land canal in 1938 gave Germany a great inland waterway system extending from the North sea to Berlin and beyond. Having completed this program in the north, the attention of the Reich has been mainly directed to another great project, known as the Rhine-Main-Danube system, which, scheduled for completion in 1945, will form an arterial waterway through the heart of Europe reaching as far as the Black sea. Before the outbreak of the European war, the work was being strenuously pushed forward, notwithstanding an admitted "lack of working power," due to shortage of men and scarcity of certain structural materials. In February, an announcement was made that Herr Hitler had approved a scheme for enlarging the Kiel canal to approximately double its present capacity. More recently, the Adolf Hitler canal in western

Germany, connecting the river Oder with the town of Gleiwitz in Upper Silesia has been opened to traffic, thus making Gleiwitz an inland port.

Russia.—An enterprising policy of inland waterway development is being prosecuted in Russia, including what is known as the Volga-Don scheme, which in regard to its ultimate goal is one of the most far-reaching. The White, Baltic, and Caspian seas are already linked up with the Volga; the new canal, for which initiatory steps have been taken, will connect the same river with the Black sea and the Sea of Azov thus linking up five seas on the northern and southern frontiers of the country. A plan has been outlined for converting Leningrad into a great river port. Another large canal, 270km. in length, has been commenced in the cotton district of Fergana in Russian Central Asia. (B. Cv.)

Canal Zone: see PANAMA CANAL AND CANAL ZONE.

Canary Islands: see SPANISH COLONIAL EMPIRE.

Cancer. *Chemistry of Tumours.*—Two well known German chemists, Kögl and Erxleben, recently published investigations on the structure of the amino acids which made up the molecules of the tumour proteins. They isolated these amino acids by standard methods and compared their optical rotatory power with that of the amino acids obtained from proteins of normal adult and embryonic tissues. The component amino acids which make up the proteins are quite numerous and some exceedingly difficult to isolate in pure form. The most convenient to study in this connection is glutamic acid, which forms a considerable percentage of the protein molecule, is fairly easy to isolate in pure form, and is not altered in its rotatory power during the course of purification. In their preliminary experiments the authors used some human and animal tumours, and some normal rabbit tissues. In the tumours they found from 15 to 44.5% of the glutamic acid was in a form which does not ordi-

narly occur. This the authors designate as the "unnatural" form. By determining the rotatory power of the isolated acid it is possible to estimate the proportion between that form which normally occurs in healthy tissues and the infrequent or "unnatural" form. The proportions varied considerably in the different tumours which were studied.

In a further paper Kögl confirms the original discovery in a new series of amino acid analyses, the normal adult and embryonic tissues containing only the pure l-form of glutamic acid. Again, a great variability was found in the amount of these "unnatural" or d-form of glutamic acid, varying from 44.5% in the Brown-Pearce rabbit tumour to as low as 2% in human uterine myoma. In tumours with a high glutamic acid content of the "unnatural" form, at least one-tenth of the total tumour protein may contain these altered acids.

The work has been confirmed on a small scale by Arnow and Opsahl, who found approximately 41% of d-glutamic acid in one adenocarcinoma of the intestine, and 26% in another. What is still more interesting, they were able to find some of the unusual acid in the tissue of the intestine near one of the growths. Other workers have not been able to confirm Kögl's findings and there the question rests.

The obvious question which now presents itself is, what, if any, relationship exists between this steric alteration in structure in some of the amino acids in tumours and the causation of cancer? Of course, as yet no proof has been given that these changes have anything to do with the causation of the disease. No evidence has been offered that the d-glutamic acid may not be present in the tissue in conditions other than cancer. Over 15 years ago Warburg made the statement that the causation of cancer lay in the peculiar method by which the cancer cells oxidized glucose. But shortly thereafter it was found that certain normal cells could do the same thing, and there has never been any conclusive evidence brought forward that there is any causal relationship between lactic acid sugar destruction and tumour growth. The differences in amino acids are more suggestive, for it is known that there may be certain differences in the pharmacologic action between dextrorotary and levorotary forms of the same substance. And, also, it is undoubted that the protein structure of the cell is more likely to carry with it important physiological differences than is probable with the sugars. It must be remembered that the cancer cell possesses a certain type of immortality, as is shown by the grafted tumours in animals, for some of these have been transplanted thousands of times and still retain all of the biological and morphological characteristics observed in the first spontaneous tumour from which they were derived.

One weak point in Kögl's argument lies in the fact that he includes uterine myomata as tumours. These growths are not true tumours, but are merely hyperplasias of the fibromuscular structure of the uterus under the influence of the female sex hormone. If the ovaries of the female are damaged by X-ray or removed by surgery, the fibromyoma disappears. In other words, the tumour has no independent and permanent existence, and in a recent paper Kögl reports finding very little of the "unnatural" glutamic acid in such growths.

As it is now generally agreed that the cancer cell is a somatic mutation form of the normal cell, the theory is attractive that such a cell is one which can only form its protein molecule by splitting the racemic amino acids in the food and using the d-form, and that once this has occurred, the capacity may remain to give a permanent characteristic to the cell. However, there is another phase of the question, and that is the astonishing capacity of some tumour cells to produce their characteristic secretions apparently fully as well as the cells in the healthy organ, showing that the malignant change has not greatly altered the cell's normal capaci-

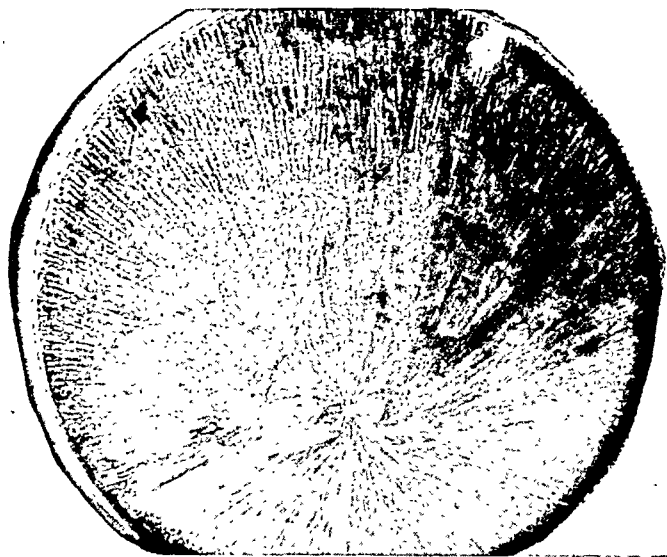
ties. This is seen in liver tumours where the cancer cells produce bile, and in tumours of the thyroid where the specific thyroid secretion is formed in abundance by the cells of the thyroid tumour, and by the curious effects on the body which tumours of the adrenal gland exert, and by the fact that tumours of the islands of Langerhans in the pancreas can synthesize insulin.

Whether or not this interesting chemical discovery will ultimately prove to have a causal relationship with the qualities of the cancer cell and thereby open some new routes of attack which may result in destruction of the neoplastic cell, a great field of interesting experimental work has been opened by this fertile study which may occupy the energies of chemists for many years, just as Warburg's incorrect assumption has led to many important discoveries concerning the sugar metabolism of various types of tissues.

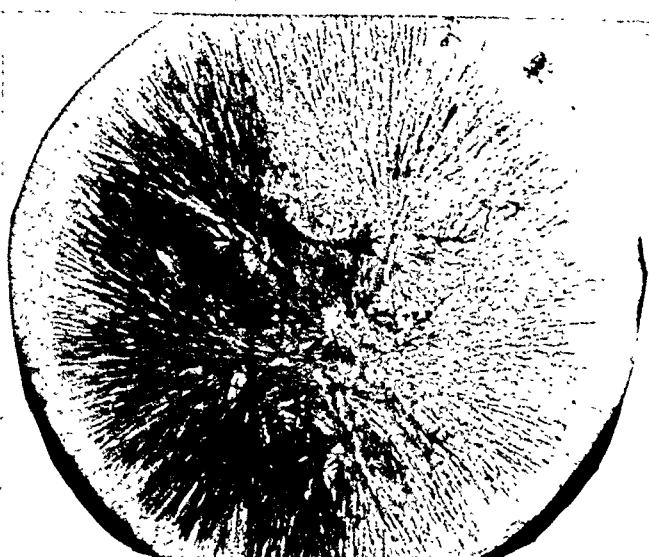
Refrigeration Treatment of Cancer.—For more than 20 years it has been known that the effect of chilling tumour cells in the body or of heating them by diathermy or of treating them with X-rays or radium produced similar morphological alterations in the cytoplasm of the cells and the nuclear structures. These changes consisted in rendering the cell membrane more permeable, hence the cells became swollen. In the nuclear substance, especially in those cells which are in the course of division, are produced the well known types of malformation, such as giant cells, cells with highly distorted mitotic figures, in all tissues studied, so that it is impossible from a microscopic section alone to distinguish between those cells which have been heated, chilled, or rayed with X-ray or radium. Unquestionably these monstrous cells are not viable, and hence do not continue to propagate in the growing tumour. The walls of the terminal arterioles may be greatly thickened if the use of these physical agents is continued for some time.

Studies of cutaneous body temperature have shown great variations in readings, the skin of the hands and feet being from 12 to 22°F below the normal for the mouth. Again, it is well known that neoplasms affect the bones and soft tissues of the extremities less frequently than other portions of the body. These observations led Temple Fay to investigate the effects of lowering the temperature in the substance of the carcinomatous growth. Five weeks of continuous local refrigeration of a tumour in a human patient was accompanied by improvement in appetite, gain in weight, freedom from pain, and shrinkage of the tumour mass. She remained comfortable for four-and-a-half months, after which there was a return of the pain. As a result of this favourable effect, other patients were exposed, using only those who were advanced and hopeless, and especially those who had tumours which had been shown to be incurable by radiation. They were treated by local refrigeration alone or with artificial reduction of the entire body temperature, by which a condition is produced resembling hibernation in animals. To produce hibernation the body temperature, as read by gastric and rectal thermocouples, was maintained at levels between 81 and 90°F. Local cooling is accomplished by ice water or brine circulating through an apparatus made to fit the structure in which the lesion exists.

Results have been observed which are of great interest. In every instance there has been a prompt reduction in pain and sometimes complete relief. This is of importance because many of the patients treated had been receiving 5 to 6 grains of morphine a day and were being considered for a last resort cordotomy, an extremely difficult and dangerous operation. By the use of refrigeration it was possible to avoid surgical intervention and to eliminate the use of drugs in almost all instances. Furthermore, there was a measurable decrease in the size of the neoplasm, coupled with a general improvement in the patients' condition, gain in weight, better appetite, and an improved mental state. As far



A NEW TEST FOR DETECTING THE PRESENCE OF EARLY CANCER, by crystallizing blood in a solution of copper chloride, was described in Sept. 1939 by Dr. Ehrenfried Pfeiffer of Hahnemann Medical college, Philadelphia. At the left is the crystallized blood mixture of a healthy person; at the right, that of a patient with cancer



as can be observed, there has been a diminution in the growth rate of recurrences. The lack of growth seems to be largely due to a reduction in the blood supply, the continuous cooling causing a contraction of the blood vessels. Such diminution in blood supply obviously points to one of the dangers of this therapy where hibernation is used, and that is heart failure from diminished nutrition in those who have vascular lesions of the heart muscle. This has been responsible for the death of several patients. So far the writers stress the absence of pain as the chief beneficial factor. The method is now being studied in several other hospitals and its risks and value in the treatment of hopeless cancer should be determined in a short time. To date no claim is made by the authors that permanent cures may be obtained. (See also ALIMENTARY SYSTEM, DISORDERS OF; EYE, DISEASES OF; MEDICINE: *Basic Research*; RADIOLOGY; X-RAY.)

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Candid Camera: see PHOTOGRAPHY, MINIATURE CAMERA.

Candy. Confectionery, largely a penny business, is the sixth most important division of the food industry in the United States. It is a penny business because the bulk of confectionery, including chocolate, is sold in penny units. Often referred to as a depression-proof industry, profits in candy making and selling have steadily decreased since 1921, considered the peak year. The decline has been due primarily to faulty and loose price structure.

According to the Department of Commerce, there are in the United States some 1,200 manufacturers of candy employing over 50,000 people, producing about 2,000,000,000lb. of candy annually, with a wholesale volume of just under \$300,000,000 and a retail volume of almost \$600,000,000. But only 38 firms do an annual business of \$1,000,000 or over, 65 firms are responsible for almost 60% of the output and about 200 firms do over 80% of the industry's tonnage. Candy is sold through some 500,000 outlets, from the corner candy store to even the shoe shine parlour. Chicago is the production centre. Boston, New York, and Philadelphia follow in importance. Preliminary report for 1939

indicates a sales increase of 3% to 4% over 1938. Because of advance in raw material prices, induced by European war conditions, candy prices were somewhat higher in 1939 than in 1938. But prices were not advanced to fully cover increases in prices of raw materials. The average value per pound of candy in 1939 was a little over 15¢ compared with about 14¢ in 1938. Per capita consumption in United States is 16lb., which means that the average American consumer buys about \$2.40 worth of candy annually.

No country in the world has commercialized candy as has the United States. Great Britain comes second—but not a very close second. Its annual retail output is about \$260,000,000. For a number of years Switzerland, Germany, and France led Europe in chocolate production. The picture has changed because of the war. Very little candy is now being produced in Europe. Chocolate is about the only item that is being made and that is used principally for consumption by soldiers. Because of war conditions very little candy is now being imported in the United States. Whereas Great Britain was responsible for the bulk of imported candy in the United States, today practically all the imported candy comes from Holland and Estonia.

The most important developments in 1939 in candy business was the increase in the demand for and sale of fancy packages. Because the new Food and Drug Act goes into effect in its entirety on July 1, 1940, candy manufacturers will be required to list all ingredients on the labels. (H. D. G.)

Cane Sugar: see SUGAR.

Canning Industry. U.S. canned food production in 1939 totalled about 312,503,000 cases, compared with 326,899,000 cases in 1938, and 234,146,000 cases ten years earlier. Production of canned food during the last ten years has increased much faster than the population. On a per capita basis, production has increased about 45% during the last ten years, and at the same time, prices of canned foods have declined.

Fruits and vegetables are the canned food items packed in largest quantity, which amounted to about 235,000,000 cases in 1939. The next largest item was canned milk, of which 50,000,000 cases were packed. The 1939 fish and meat pack totalled about 28,000,000 cases. The canning industry during 1939 used over 10,000,000,000 tin containers, gave employment to about 350,000 persons, and utilized a portion of the crops grown by 350,000 farmers.

Of especial interest to the industry were developments concern-

ing labelling of canned foods under the Food, Drug, and Cosmetic Act of 1938. The labelling provisions of this Act were to have become effective in June 1939, but were postponed by the Lea Act until Jan. 1, 1940, and, under conditions set forth in a regulation under the Lea Act, until July 1, 1940.

Hearings on standards for various vegetables and fruits began in January and continued through April. Products under consideration included tomatoes and tomato products, apricots, peaches, pears, cherries, and a list of about 40 vegetables. Final standards for tomatoes and tomato products, and peaches, were issued in 1939, and the others were expected early in 1940. Final standards for these products, and others yet to be considered, will dictate the labelling requirements for the respective products, and their provisions have the basic purpose of providing the consumer with descriptive information.

The program of economic research sponsored by the industry, but under the active guidance of economists not directly connected with the industry was, in 1939, directed in its first phase toward investigation of financing methods. There was further technological research devoted to improvement of quality of canned foods. Increased information on the processing of non-acid products was obtained, which was used in the preparation of a processing bulletin (No. 26-L, Fourth Ed.) published by the National Canners Association.

There was a notable trend in the direction of standardization of can sizes. Resulting from a collaborative consideration of the problem by the National Bureau of Standards and the industry, recommendations were made as to containers for fruits and vegetables. It is expected that the coming packs will show substantial acceptance of the recommendations that have been made.

(E. J. C.)

Canton Island: see PACIFIC ISLANDS, BRITISH; SOUTH SEA AND EQUATORIAL ISLANDS.

Cape Verde Islands: see PORTUGUESE COLONIAL EMPIRE.

Capital Punishment. In the United States, New York at the end of 1937 took the first step toward joining the large majority of States which allow the jury to grant mercy in capital cases. The New York State Penal Code now allows the jury to grant mercy in felony murder cases (homicide in the commission of a felony: burglary or robbery).

Five States now retain absolute capital punishment: Vermont, Connecticut, Massachusetts, New Mexico, and North Carolina. Seven States have abolished the death penalty: Maine, Rhode Island, Michigan, North and South Dakota, Minnesota, and Wisconsin.

South Dakota (1939) restored the death penalty, but failed to make an appropriation for setting up an electric chair, in spite of the fact that the governor, following a sensational crime, had approved the capital punishment bill. The matter must come before the 1941 Legislature. The South Dakota measure, like the old Kansas law, forbade execution until a year after sentence.

Kansas, for 28 years without statute capital punishment, restored the death penalty in 1935. Though 11 States still hang criminals, the majority, 21 States, put them to death by electrocution. Eight States have substituted lethal gas. All of the States with lethal gas chambers are in the west except North Carolina and Missouri. One State, Utah, gives the condemned the choice of hanging or shooting. The former has never been elected.

On Nov. 16, 1938, the British House of Commons passed, by a vote of 114 to 89, a Resolution by Vyvyan Adams, M.P. favouring abolition of the death penalty experimentally for a period of five years. While the Government took a neutral position, it declared that any experimental change in the law should extend beyond the five year period.

In Central and South America the following countries have ended capital punishment, now sentencing instead to long but limited prison terms: The Argentine; Brazil, 30 years (except for "extreme perversity"—1938); Colombia, Ecuador, 16 years; Peru; Venezuela, 20 years; Uruguay. Central America: Costa Rica, Dominican Republic, Honduras, Panama, and the population centres of Mexico—Mexico City, Federal Jurisdiction and seven of the 28 States.

In Europe the Low and the North countries still retain the abolition of the death penalty. The greater part of Europe is, however, under martial law. Rumania has receded from abolition and restored (1939) the death penalty.

(V. Pr.)

Carnegie Trusts. Carnegie Corporation of New York, established by Andrew Carnegie in 1911 and endowed with \$135,000,000, expends its annual income in grants to institutions and agencies whose activities aim at the advancement and diffusion of knowledge and understanding among the people of the United States and of the British Dominions and Colonies.

During 1938-39, the corporation trustees appropriated a total of \$4,846,126: library interests, \$697,200; adult education, \$204,921; fine arts and museums, \$1,157,325; research and publication, \$1,253,650; general educational purposes in schools, colleges, universities, etc., \$1,533,030. The amount appropriated since 1911 totals \$176,728,689.

The five other separately administered Carnegie organizations in the United States, which were founded by Mr. Carnegie for specific purposes before the establishment of the Corporation, with endowments now ranging from \$10,000,000 to \$30,000,000, followed their established programs described regularly in their annual publications.

Carnegie Institute of Pittsburgh (1896), which comprises an institute of technology, a museum of fine arts, a music hall, a museum of natural history, a public library, and a library school, carried out its normal programs. The annual international art exhibit at the museum again attracted wide attention.

Carnegie Institution of Washington (1902), devoted to scientific research, has expended since its organization \$40,136,204 in its program of encouraging investigation, research and discovery, and the application of knowledge to the improvement of mankind, specifically by work in astronomy (Mt. Wilson observatory), terrestrial magnetism, geophysics, animal and plant biology, and historical research (especially in Yucatan).

Carnegie Hero Fund Commission (1904), established to recognize heroic acts performed in the United States of America, the Dominion of Canada, the Colony of Newfoundland, and the waters thereof by persons the nature of whose duties in following their regular vocations does not necessarily require them to perform such acts, made 46 awards of medals, or of funds for worthy purposes, in recognition of acts of heroism, thus bringing the total number of awards since 1904 to 3,069, and the total of money grants to \$5,662,150.

Carnegie Foundation for the Advancement of Teaching (1905), established to provide retiring pensions for teachers and to advance higher education, paid \$1,960,472 in retiring allowances to retired college professors, or their widows, making a total of \$36,691,614 paid for such purposes since its establishment. It has also continued, chiefly from funds provided by the Corporation, its program of educational research, including such activities as teacher testing program, graduate examination study and a comparative examination study.

Carnegie Endowment for International Peace (1910), established to serve the purpose indicated by its name, expended \$685,938 in its efforts to further friendly understanding among the

nations of the world. Continued progress was made also in the study of Canadian-American relations, the findings of which are being reported in 44 volumes, published chiefly by Yale university, Ryerson, and Oxford Presses. This activity was made possible by Corporation grants to the Endowment. (F. P. K.)

Caroline Islands: see PACIFIC ISLANDS, MANDATED.

Carter, Howard (1873-1939), British Egyptologist, was born in Swaffham, Norfolk, England, and was educated by private tutors. His first expedition to Egypt was in 1890. Two years later he assisted Sir Flinders Petrie in an excavation at Tel el Amarna. In 1907 he began a long series of excavations of royal Egyptian tombs that culminated in his discovery, on Nov. 4, 1922, of the stairway leading to the entrance of Tutenkhamon's sepulchre. This discovery, widely heralded in the world's press, enabled archaeologists to piece out perhaps the most intimate picture yet available of early Egypt. Carter also uncovered the valley temple of Hatshepsut, the tombs of Thotmes IV and Amen Hotep I and other royal and private burial places. He died in London March 2. See *Encyclopædia Britannica*, vol. 4, p. 940, and vol. 22, p. 634.

"Cash and Carry" Plan: see NEUTRALITY.

Catastrophes: see DISASTERS.

Catholic Rural Life Conference, National.

The 17th annual convention was held at Spokane, Wash., in October. Rt. Rev. Vincent J. Ryan, of Fargo, N.D., was elected president. Rev. James A. Byrne remained executive secretary, with headquarters at 240 Summit avenue, St. Paul, Minnesota. The major part of the discussions centred about the recently issued *Manifesto of Rural Life*, which offers the basic idea that "the special adaptability of the farm home for nurturing strong and wholesome Christian family life is the primary reason why the Catholic Church is so deeply concerned with rural problems." Other topics of exploration were colonization and land-settlement programs, rehabilitation of rural parishes, youth organizations, adaptations required in the curriculum of primary and secondary schools.

Founded in 1923 by the present bishop of Kansas City, Mo., the Most Rev. Edwin V. O'Hara, the Conference devoted its early effort to the task of bringing religious advantages to the spiritually underprivileged in rural districts. It endeavoured to vitalize rural parishes, originated vacation schools, conducted correspondence courses, etc. In its later development, it undertook the task of translating the Christian principles of justice and charity to rural economics, social problems, and education.

The conference is not composed of farmers or of those engaged in agricultural labours, though these are members. It is primarily an organization of lay and clerical leaders actively interested in the well-being of the farm population and in the prosperity of agriculture. It co-operates with the National Catholic Rural Life Bureau of Washington, D.C., and State and Federal agencies. In addition to the *Manifesto of Rural Life*, it has issued as its handbook, *Catholic Rural Life Objectives*, and publishes a quarterly, *Rural Life Bulletin*. (F. X. T.)

Catholic Welfare Conference, National.

This official agency of the Catholic hierarchy of the United States has for purpose the unification and co-ordination of Catholic activities. On the 20th anniversary of its founding, March 24, 1939, Pope Pius XII lauded the bishops for their "wisdom and

foresight" in "meeting the problems of these changing times," and in his American Encyclical referred to this "organization which supplies a well-adapted instrument for your episcopal ministry."

The N.C.W.C., as it is popularly called, is directed by an administrative board of ten archbishops and bishops, elected at the annual meeting of the hierarchy. Most Rev. Samuel A. Stritch, archbishop of Chicago, succeeded Most Rev. Edward Mooney, archbishop of Detroit, as chairman of the administrative board and of the executive department. The administrative board is assisted by seven bishops, chosen by itself. The general secretary is Rt. Rev. Msgr. Michael J. Ready. National offices are located at 1312 Massachusetts ave., N.W., Washington, D.C.

The activities of the N.C.W.C. are divided into departments, bureaus, and committees, each headed by an episcopal chairman:

Executive.—Directs the varied operations of the Conference. Publishes the monthly official organ, *Catholic Action*, which is used by some 10,000 study clubs, and issues or distributes pamphlets and books dealing with current Catholic topics. Conducts a bureau of immigration which handles thousands of cases annually. Assists the Confraternity of Christian Doctrine, which operates in 113 American dioceses, 22 in Canada, and 14 in Latin America. The fourth national convention, held in Hartford, Conn., was attended by 20,000. **Education.**—Engages in statistical and research work, issues publications helpful to the work of the Catholic school system, which includes 2,555,161 students, and interests itself in legislative proposals, such as the Thomas bill. **Social Action.**—Deals with problems of industry, rural life, family life, citizenship, etc. Prepares programs for national and regional discussions, and publishes a great number of pamphlets on these topics. Conducts a Woman's Institute on Industry, and regional Priests' Schools for Social Action. **Press.**—Issues the *N.C.W.C. News Service*, a weekly release of Catholic news which serves 452 publications in 24 countries. **Legal.**—Supplies information and guidance on legal and legislative matters that affect Catholic interests, and observes Federal and State legislation. **Lay Organizations.**—The National Council of Catholic Men, among other activities, sponsors the "Catholic Hour," heard weekly over 81 broadcasting stations, and maintains the Catholic Evidence Bureau. As occasion arises, represents Catholic sentiment on national questions. The National Council of Catholic Women undertakes to serve as a unifying force among women's organizations and supports a School of Social Service in Washington. **Committees.**—Chief among these are: Motion Pictures which directs the Legion of Decency; Decent Literature, which combats objectionable periodicals; Catholic Refugees, which has handled 2,756 cases during 1938 and 1939.

Statements issued by the administrative board dealt with labour relations, advocated increased efforts for international peace, called for a crusade to promote "civic virtues in a Christian democracy," deplored the social injustices toward the Negroes, expressed sympathy for Poland and authorized a committee for Polish relief, and expressed gratitude to the pope for his peace proposals, with assurance that American Catholics would "join in the efforts of their common Father."

The year 1939 marked the 20th anniversary of the issuance of the "Bishop's Program for Social Reconstruction." Ten of the 11 principal recommendations made in 1919 have been wholly or partially translated into fact. (F. X. T.)

Cattle. Further increases in the size of beef and dairy cattle herds in 1939 were reported in a number of countries. In the United States the number of cattle on farms Jan. 1, 1940, was reported by the Department of Agriculture as 68,769,000 compared to 66,789,000 a year earlier. Of the increase of 1,980,000 head, about one-fourth was in animals kept for milk and about

three-fourths in beef cattle. Milk herds in 1939 totalled 36,421,000, and in 1938 were 35,897,000, while beef cattle numbered 32,248,000 in 1939 and 30,892,000 in 1938. The average value of all per head was \$40.57 in 1939 and \$38.45 in 1938. The total inventory value in 1939 was \$2,790,213,000, an increase of \$221,962,000 over 1938 and the highest since 1930. Increased consumer buying power, owing to larger industrial activity, and abundance of feed at favourable prices led to the increase in values. Imports of cattle into the United States in 1939 were 753,570 head, of which 478,565 were from Mexico and 274,384 from Canada. In 1938 imports were 424,022, of which 285,554 were from Mexico and 137,773 from Canada. Three-fourths of the increase of cattle in 1939 were in States bordering the Mississippi river or eastward. There were sharp reductions in Texas and several western States. Possibly a larger number of cattle were being fed for market in the fall and winter of 1939 than ever before. Slaughter of cattle the first 11 months in the United States was 8,672,895 in 1939 and 9,018,470 in 1938; calves, 4,882,927 in 1939 and 5,078,392 in 1938.

War conditions in Europe and Asia made official statistics difficult or impossible to obtain in many countries.

The following data on numbers of cattle in different countries in 1939 and 1938 are from official reports of those countries, or the International Institute of Agriculture, or U.S. consular reports or Foreign Crops and Market reports of the U.S. Department of Agriculture.

Numbers of Cattle in Certain Countries, 1938 and 1939

	1939	1938
Canada	8,474,600	8,511,200
United Kingdom	8,875,200	8,761,900
England and Wales	6,762,200	6,714,300
Scotland	1,360,000	1,315,700
Northern Ireland	753,000	731,900
Denmark	3,258,000	3,186,000
New Zealand	4,565,000	4,506,000
Hungary	2,379,532	1,882,031
Netherlands	2,817,314	2,763,453
Switzerland	1,711,000	1,700,585
Estonia	705,000	660,900
Czecho-Slovakia (Jan. 1, 1939)	3,407,046	3,393,248
Latvia	2,162,500	2,102,380
Lithuania	1,103,550	1,097,340
Bohemia-Moravia Protectorate	2,280,735	2,311,037
Belgium	1,689,680	1,710,037
France . . . . .	..	15,622,000
U. S. S. R. . . . .	..	63,200,000
Sweden . . . . .	..	3,036,000
Inner Mongolia	560,000	..
Yugoslavia . . . . .	..	4,267,339

(S. O. R.)

Cedillo, Saturnino (? -1939), Mexican rebel general and politician, was once a lieutenant of "Pancho" Villa and was brought up in the tradition of armed revolution. He became a general of the National Revolutionary Gov't in 1929 and was twice Mexican minister of agriculture, the last time in the cabinet of Pres. Lázaro Cárdenas, from June 1935 until his resignation in 1938. Cedillo was long the political "boss" of the State of San Luis Potosí, and commanded a private army of 15,000 men despite its proscription by the national Government. During the last week in May 1938, he led an unsuccessful revolt of peasants against the Cárdenas government in San Luis Potosí. He was slain on January 11 in a skirmish with Federal troops near the town of Matehuala.

Celebes Islands: see DUTCH EAST INDIES; NETHERLANDS COLONIAL EMPIRE.

Cellulose Products. The total consumption of cellulose has shown a steady increase, no one industry which uses cellulose expanding at the expense of others. Reforestation programs, particularly in the Scandinavian countries and the United States, assure a future supply of wood cellulose. The process of producing sulphite pulp from wood is fundamentally the same for both paper pulp and viscose pulp, the latter usually being a better grade.

While spruce pulp is the stock raw material for making viscose, many other materials have been tried in an effort to exploit the sources most readily available. In Germany beech wood is used; in Italy, Malacca cane and *Arundo Donax* reed; in the United States and Canada, Western hemlock; in France, chestnut and pine; in Australia, eucalyptus. On a small scale, bagasse has been used in the United States, straw in the Argentine, Chile, and South Africa, bamboo in India and Indo-China. In the United States a viscose-grade pulp is about to be produced commercially from southern pine. Although such sources as reeds and straw are cheap they are often non-uniform in cellulose content and are difficult to process. Also pulp mills built for wood are not suitable for handling agricultural waste materials without change in equipment. Acetate rayon, produced in considerably less tonnage than viscose rayon, is still made from cotton linters although production from a specially developed wood pulp high in alpha-cellulose is in an experimental stage.

Expansion in the rayon industry has been more in the production of staple fibre than of rayon yarn. Staple fibre is made by cutting rayon filaments into short uniform lengths which are spun in the same manner as cotton or wool instead of being used as continuous filaments. A modification of viscose rayon is that of a curly staple fibre which can be blended and spun with wool more readily than the straight fibre.

Another modification is a stronger and more elastic but less extensible filament, more heat resistant than cotton, suitable for use in automobile tire cords.

Of great assistance in the development of new pulps is the standardization of methods for their evaluation, which also aids in meeting definite specifications. Newly designed machinery utilizing plastics, stainless steel, and chromium plate, has greatly speeded up the process of conversion of pulp into viscose and thence into yarn. Rayon yarn can now be spun at the rate of 70 metres per minute and finished 5 minutes after it issues from the spinnerette.

New chemical treatments to produce rayon of a dull lustre continue to be patented.

Substitution of paper milk containers for glass bottles has been adopted in the United States on a small scale. A related development is the preparation of paper board which is nearly free from bacteria, accomplished by diluting freshly bleached virgin paper pulp with chlorinated water. (See also RAYON; PAPER; PLASTICS INDUSTRY.)

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Cement. Since the product is used largely in the building industry, the cement industry has been seriously affected by the depression decline in building operations, and has shown one of the slowest recoveries found in any phase of the

mineral industries. Total cement production in the United States declined 9% in 1938, to 107,062,000 barrels. The great bulk of the output is the ordinary Portland cement; the special types of masonry, natural, and pozzolanic cements average only 1-2% of the total, while high-early-strength cement has increased to 3%.

In spite of the fact that the United States output through Oct. 1939 was 16% above that for the same period of 1938, and 6% above that for 1937, shipments had exceeded output by over 4,000,000 bbl., indicating a consumption of about 125,000,000 bbl. for the year. Canadian production through Sept. 1939 was 5% ahead of 1938, but 8% behind 1937, indicating an output of about 5,750,000 bbl. for the year, as compared with 5,519,000 bbl. in 1938.

World production, estimated at 83,000,000 metric tons in 1937, was distributed as follows: United States 24%; Germany 16%; United Kingdom 9%; Japan 8%; U.S.S.R. 7%; Italy 5%; France 5%; Belgium 3%; Czechoslovakia, Poland, India, Canada, South Africa, Yugoslavia, and Australia 8%; the remaining 15% is widely scattered in small amounts. (See also GYPSUM.)

(G. A. Ro.)

Centennials: see CALENDAR, 1940, page xx.

Central America, the region between Mexico and Colombia, embracing the republics of Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama, the Panama Canal Zone, and the colony of British Honduras. The area is approximately 222,674 sq.mi.; the population was estimated at 7,731,000 in 1939. The main population centres are on the highland plateau adjacent to the Pacific, where the population from Costa Rica to Guatemala is white, mestizo, and Indian, tending more and more to pure Indian toward the north. The low Caribbean slope, including British Honduras, is largely Negroid. A large Negro element is also present in Panama. In the republics, Government is, in practice, by dictators, with the outstanding exception of Costa Rica, and to a less degree in Panama and Nicaragua.

The Central American republics were active participants in the inter-American efforts to maintain the neutrality of the Western Hemisphere in the conflict which engulfed Europe in Sept. 1939, and Panama was host to the Inter-American congress which met on September 21. Economically, there was great uncertainty, owing to European war, and external trade declined seriously in the last four months of the year. In 1938, Central American imports totalled approximately \$74,772,000 and exports \$61,931,000 in value, declines of from 10% to 15% over 1937. Nearly 40% of exports went to the United States, who supplied 60% of imports. Imports are largely foodstuffs, as flour, and textiles, machinery, and other manufactured articles. Coffee from the Pacific uplands, bananas from the lowlands, and other tropical agricultural products (notably chicle and hemp from British Honduras) comprise the main exports. Corn and beans are grown extensively for domestic consumption. Education and literacy vary from country to country, with Costa Rica the most advanced. (See BRITISH HONDURAS; COSTA RICA; GUATEMALA; HISPANIC AMERICA AND THE EUROPEAN WAR; HONDURAS; NICARAGUA; PANAMA; PANAMA CANAL AND CANAL ZONE; SALVADOR, EL.) (L. W. BE.)

Ceramics: see FELDSPAR; GYPSUM.

Cereals. No shortage of food and feed grains in 1940, because of the various wars, is indicated by reports of the International Institute of Agriculture. The world carry-over of wheat Aug. 1, 1939, was estimated by the Institute as 687,000,000 bu., enough to satisfy all import requirements without the addition of surpluses from the new crop. Import requirements for 1939 were estimated at 618,000,000 bu. and requirements for 1940

were forecast at 600,000,000 bushels. World wheat production in 1939 was placed at 4,195,000,000 bu. compared to 4,503,000,000 bu. in 1938. The comparison is incomplete, however, owing to various governments having curtailed economic information after the outbreak of war. The world estimate does not include U.S.S.R. which produced 1,494,000,000 bu. in 1938. China, Iran, and Iraq are also not included. Sowing of winter bread grains in belligerent countries approximated the normal acreage despite shortage of labour because of the war. In the United Kingdom a large part of the grasslands have been plowed for food and feed grains, of which production will be increased, particularly oats for livestock feed. World rye production for 1939 was estimated by the Institute as 1,066,000,000 bu., of which 985,000,000 bu. was in Europe, 56,000,000 bu. in North America and 25,000,000 bu. in the rest of the world, excepting U.S.S.R. which produces approximately as much rye as all the rest of the world. World rye production in 1938 was 1,072,000,000 bu., of which 976,000,000 bu. was from the European harvest. Thirty-three countries produced 1,195,669,000 bu. of barley in 1939 and 1,101,211,000 bu. in 1938. Oats production in 1939 was 2,510,449,000 bu. from 26 countries, compared to 2,632,628,000 bu. in 1938. Here again the comparison is inexact because of war-time restrictions on information. No complete figures for corn are available, but the United States which produces most of the corn had a harvest of 2,360,060,000 bu. for grain in 1939 compared to 2,303,265,000 bu. in 1938 when the world crop was 3,868,953,000 bushels. In addition to the corn crop for grain 31,195,000 tons of silage were harvested and 5,699,000 ac. of corn were "hogged down" or used for forage.

(S. O. R.)

Céspedes y Quesada, Carlos Manuel de

(1871-1939), Cuban statesman, was born in exile at New York city on August 12, the son of a wealthy planter who was leader of the separatists in the Cuban Ten Years' war (1868-78). He was educated in the public schools of New York city, in Germany, and France, and at the University of Havana, where he received a law degree. From 1895 to 1898 he was a colonel in the Cuban Army and governor of Santiago province. After the Cuban declaration of independence he was for six years (1902-08) vice-president of the house of representatives. In 1909 he entered the diplomatic service and became successively minister to Italy, Argentina, the U.S.A., France, and Great Britain. From 1922 to 1926 he was secretary of State; he resigned after a series of disagreements with Pres. Gerardo Machado, whom he later conspired to overthrow. After Machado's resignation in 1933, Céspedes was sworn in as president, but he served for only 23 days (August 12-September 5) before the revolutionary junta demanded his resignation also. Thereafter he became minister to Spain until his retirement in 1935. He died in his home at Vedado, a suburb of Havana, on March 28, the day before the death of his long-time enemy, Machado (*q.v.*).

Ceylon. Area 25,332 sq.mi.; pop. (est. Dec. 31, 1938) 5,830,000. Chief towns (pop. census 1931): Colombo (cap. 284,115); Jaffna (45,708); Galle (34,424); Kandy (37,147). Governor, Sir Andrew Caldecott; languages, English, Sinhalese, Tamil; religions, Buddhism and Hinduism the chief.

History.—The island suffered a set-back from its return of prosperity in 1937; the visible balance of trade having fallen from Rs. 88 millions in that year to Rs. 49 millions in 1938. Constitutional difficulties and racial animosities did not help the situation.

Industrial progress has been noteworthy. In May, Rs. 14½ millions were voted for an important hydro-electric scheme. In

August a state-aided bank was opened with an authorized capital of Rs. 17½ millions. It will co-operate with the department of commerce and industries, which was established in 1938 for experimenting in new industries which, in default of private enterprise, the government hopes to organize:—coir, plywood, cement.

Education.—In 1938: Primary, Sinhalese and Tamil: schools 6,151; scholars 702,097; assisted schools 3,007; scholars 250,831 boys, 178,967 girls.

Banking and Finance.—Revenue (actual 1938-39) Rs.117,426,650; (est. 1939-40) Rs.123,484,600; expenditure (actual 1938-39) Rs.120,502,590; (est. 1939-40) Rs.129,504,965; public debt (Sept. 30, 1938) Rs.194,191,333; currency: Rs.1=100 cents = 1s.6d.

Trade and Communications.—Overseas trade, merchandise, 1938: imports Rs.235,529,101; exports (domestic) Rs.263,534,522; re-exports Rs.21,288,000. Communications and transport 1938: roads, main surfaced, 4,485 mi.; railways (117 mi. narrow gauge), total 960 mi.; shipping, entered 1938, 13,228,439 net tons; motor vehicles licensed (Dec. 31, 1938): 21,044 motor cars and taxis; 4,320 trucks and vans; 2,625 omnibuses; 2,992 cycles; wireless receiving set licences (Dec. 31, 1937) 4,911; telephone instruments in use (1938) 10,424.

Agriculture.—Production, 1938 (exports), in metric tons: copra (including coconut oil), 197,800; tea, 106,900; rubber, 60,000.

Chain Stores.

The record of the corporate chain store for 1939 is one of the best in the history of the chain store industry. In most fields, the corporate chain showed significant increases in volume as compared with 1938, and in some cases as compared with any previous year. Moreover, the gain in net profits appears to have been more substantial than the gain in volume.

The record for 30 representative corporate chains shows that sales increased about 11% during 1939 as compared with an increase of somewhat less than 7% in general retail trade. The month of December set a new mark for many corporates and several reported December sales as better than for any month in their history.

On the legislative front, the corporate chain fared reasonably well during 1939. The Patman "death sentence" measure, re-introduced into Congress as H.R. 1 in 1939 did not receive a hearing and remains lodged with the Ways and Means Committee.

During 1939, in spite of the fact that about 90 anti-chain measures were sponsored in 34 State legislatures, no new State was added to the list of 22 which obtained at the beginning of 1929. Only four States (Montana, North Carolina, South Dakota, and Tennessee) passed chain-store tax measures and in each instance the action merely amended existing laws.

On March 21, 1939, the Kentucky chain store tax measure of 1934 was held unconstitutional by the Kentucky Court of Appeals. On June 19, 1939, the Pennsylvania chain store tax measure of 1937 was declared unconstitutional by the Pennsylvania Supreme Court. In February, the New Jersey Supreme Court voided municipal taxes on self-service markets. In November, the Georgia Supreme Court voided a municipal tax on the corporate chains based upon the total number of units operated in the United States and which would have cost the A.&P. chain \$1,200-\$1,400 per year for each store operated in Columbus, Georgia.

Thus, the year 1939 closed with 20 anti-chain State tax measures in effect, with some indication that punitive municipal chain taxes were less likely, and with no serious threats of new State chain tax measures for 1940, since only nine legislatures will be in session and since four of these nine held sessions during 1939 without passing such legislation.

In important respects, the most significant legal development during 1939 occurred in Colorado and confirmed the conclusion that there can be no assurance that the difference between decentralized and centralized ownership will forever exempt the "voluntary" and the "co-operative" chain from special taxation. On May 29, 1939, the Colorado Supreme Court held that the Gamble-Skogmo Company, owning and operating a chain of five automobile supply stores and having 35 additional, independently owned stores affiliated under a franchise plan and a "tight" buying contract, constituted a chain under the act of 1934. Immediately, Colorado's attorney general held that all automobile dealers in the State under franchise for individual makes of cars and all service station operators under contract to distribute individual brands of gasoline were also taxable as "chain" units under the act. In October, Colorado's State treasurer announced intentions of filing tax claims against all independents operating in groups under the wing of a single wholesaler.

While it is often said that few "voluntaries" or "co-operatives" have such stringent contracts with regard to the supervision of merchandising activities by the wholesale supplier as to make these member organizations in effect a chain for purposes of taxation, 1939 clearly indicates that there is some political intention to give to the voluntary chains "the same medicine that the corporate chains have been forced to swallow for the last decade." This intention is likely to find a legal way of accomplishing its purpose and hence many of the State chain store tax laws may soon reach the pockets of the independents who sponsored them, since, in such important fields as food, gasoline, auto accessories, and tires, very large numbers of "independents" operate under group merchandising plans.

During 1939 the merchandising efforts of the corporate chain were largely concentrated on: (1) the enlargement and modernization of existing stores, and the closing of smaller, unprofitable units, (2) the establishment of super-markets or large self-service units, (3) an increase in the variety of merchandise sold, (4) increasing direct purchases from suppliers who deal only with large buyers, (5) the development and promotion of chain store brands, and (6) the cultivation of public good will.

In a year when anti-chain taxation has been at a low ebb, the number of chain store units has decreased. The process of weeding out unprofitable neighbourhood stores and of establishing large self-service stores—particularly in the food field—has gone on, if at a somewhat slower pace than in previous years. By the middle of 1939, reliable estimates indicated that about one-third of the sales of the A.&P. chain were handled by either super-markets or large self-service stores.

The threat of serious competition for the corporate chain from independent "super-markets" has diminished. Estimates now indicate that about 46% of all the "supers" are old-line corporate chain super-markets, while 38% are independent "supers" and 16% are super-market chain units not operated by old-line corporate chains.

Moreover, the fear of the growing number of State Unfair Sales Acts—loss leader laws—has operated to limit the establishment of independent "supers" and the real estate promotion of the "super" idea.

During 1939, the corporate chains spent about \$126,000,000 on store construction and modernization, an increase of 12.2% over similar expenditures in 1938. Of this amount, about \$28,000,000 was expended in the grocery field, largely in connection with the opening of self-service markets handling wide varieties of food products. Similar expenditures in 1938 totalled about \$17,000,000.

In the main, the corporate chain has met the loss of brokerage and allowances under the restrictions of the Robinson-Patman Act by increasing its direct purchases on a net price basis from those

suppliers who cater only to big buyers and who consequently do not run the risk of discriminating against the "dozen-lot customer." The year 1939 witnessed the filing of several complaints by the Federal Trade Commission against "voluntary chains" for alleged discriminatory brokerage and allowances so that the corporate chain is heartened by the indication that the enforcement of the Robinson-Patman Act will not unduly penalize the corporate in favour of the voluntary.

The corporate chains have continued to seize upon every merchandising opportunity to cultivate a public appreciation of their economic importance. The food chains have actively co-operated with the Government's food stamp plan to distribute surplus agricultural commodities. In some instances food chains undertook the promotion of surplus foods designated by the Department of Agriculture in cities where the stamp plan was not in effect. Producer-consumer drives were continued by the corporate chains and moved surpluses of citrus fruits, dairy products, prunes, fresh vegetables, poultry and eggs, and apples. A greater variety of corporate chains co-operated in the 1939 producer-consumer drives—practically all the corporates assisted in the promotion of the consumption of cotton; the drug, variety, confectionery, and other chains operating soda fountains as well as the food chains devoted the month of June to the promotion of milk and dairy products.

With the increasing evidence of serious rifts in the ranks of the organized anti-chain groups, with a growing appreciation of the fact that punitive anti-chain measures may boomerang upon their independent sponsors, with a widening good will toward the corporate on the part of the farmer, organized labour, and the general public, and with complete faith in the alertness and flexibility of its management personnel, the corporate chain appears to face 1940 with a new confidence. (See also LAW [CASE]: *Trade Regulation*; RETAIL SALES.) (G. R. C.)

Chamberlain, Arthur Neville (1869–), British statesman (see *Encyclopædia Britannica*, vol. 5, p. 201), prime minister of Great Britain since May 28, 1937. During 1939 Mr. Chamberlain's popularity which, on the disappointing aftermath of the Munich Agreement of Sept. 1938, had shown signs of deteriorating, steadily rose, and long before its close he had, certainly insofar as his war policy was concerned, the whole country united behind him. The year opened with his visit, in the company of Lord Halifax, to Rome (January 11–14), where he had important conversations with Mussolini and the King—a good understanding, though no actual agreement, being reached—and was received in audience by Pope Pius XI, less than a month before His Holiness's death. On February 7 Mr. Chamberlain opened the Palestine conference and on March 2 made history by being the first Conservative prime minister to attend a reception at the Soviet embassy; but following the German annexation of the Czech state (March 16) his time and energies were absorbed by the crisis and ensuing European war (q.v.).

On January 5 Mr. Chamberlain welcomed President Roosevelt's defence in his message to Congress of religion, democracy, and international good faith as "yet another indication of the vital role of American democracy in world affairs"; from Birmingham on March 17 he broadcast a reasoned defence of his foreign policy, and before Conservative women in London on May 11 he justified the introduction of conscription and made it abundantly clear that, if ever called upon to do so, Great Britain and France would unhesitatingly honour their pledge to Poland. At Cardiff on June 24 he exposed again the hollowness of the German "encirclement" plea, and warned Japan that the British Government could not submit to dictation.



THE FAMOUS UMBRELLA was forged into a sword after Hitler's seizure of Czechoslovakia and Memel in Mar. 1939. Cartoon by Temple in *The Times-Picayune*, New Orleans

A Scottish holiday in August was shortened by the crisis, and, after his dramatic broadcast announcement at 11.15 A.M. on Sunday, September 3, that "this country is at war with Germany," one of his first acts was to broadcast (September 4) in German to the German people that Britain was fighting not them but "a tyrannous and foresworn regime which has betrayed not only its own people but the whole of Western civilization and all that you and we hold dear." From September 10 onward Mr. Chamberlain gave each week in parliament a review of the war situation, and on November 26 broadcast again, defining the British war aims and giving, in general terms, a forecast of the new Europe. On December 5 he visited the British troops in France; he was later shown a section of the Maginot Line by General Gamelin, and returned to England on the 19th after attending a dinner given in his honour by M. Daladier at the Quai d'Orsay the previous evening. Mr. Chamberlain during the year had important interviews with Mr. de Valera, M. Gafencu, and the Prince-Regent of Yugoslavia, among others; he was proposed for the Nobel Peace prize, streets in Cannes and Lisbon were named for him, and he received honorary degrees from the universities of Oxford, Edinburgh, and Strasbourg. (L. H. D.)

Chambers of Commerce. Business activity in the United States was notably stronger in 1939 as compared with 1938. Chambers of commerce across the country were particularly pleased with this and with their efforts to reduce unemployment. They were likewise encouraged by the more favourable public attitude toward business and the more constructive policies supported by men in public life.

The chambers continued their various promotive and service activities, and their attention to such subjects as taxes, the expenditure of public funds, and governmental regulation. They maintained their interest in world trade developments. After war broke out in Europe, many chambers were called upon for special

services relating to export and import business.

Trade and industrial associations, State and local chambers of commerce co-operated in the Chamber of Commerce of the United States. This organization and all of its affiliates carried on the "What Helps Business Helps You" educational campaign for wider understanding of the part business plays in American progress.

Abroad.—For the chambers of commerce in Great Britain and Northern Ireland, the year 1939 was remarkable for the attention given to certain national and international questions. The national defence program, growing tension in the international field, increasing complexities in meeting export trade demands, altering laws and regulations governing home trade and industry, new financial and taxation problems, were important in chamber work until the outbreak of war. The individual chambers and the Association of British Chambers of Commerce then bent their energies to further tasks presented for local and national service.

(W. G. Cy.)

Chandler, Charles deForest (1878-1939), American aeronautics authority and balloonist, was one of the first men in the United States to recognize the military importance of aviation after the Wright brothers had made their initial heavier-than-air flights. Born in Cleveland, Ohio, on December 24, he was educated at the Case School of Applied Science and was appointed first lieutenant of the U.S. Army in 1901. He made his first balloon flight in 1906 and was a member of the committee which conducted trial flights of the first military plane bought by the Army from the Wright brothers in 1908. In 1912, while he was commander of the first Army aviation school at College Park, Md., he demonstrated the practicability of machine-gun fire from a plane in flight. During the World War he was chief of the balloon section of the U. S. Air Service in France and was decorated with the Distinguished Service medal. He was appointed colonel in 1917 and retired from active service in 1920, after which he devoted much of his time to writing on aeronautics. He died at Washington, D.C., on May 18.

Channel Islands: see GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Cheese. Perhaps the most marked war-time development in the cheese market in 1939 was the cessation of Finnish shipments to that country's usual outlets, the United States, Britain, and Belgium, and the increased Swiss production to supply those markets. In Canada the first plan of the British war-time food control offered producers a net of only about 10½¢ per pound. The British Government later agreed to accept at better prices all Canadian cheese that might be shipped, consular ad-

vices reported. In the United States, cheese production was slightly less than 1938 and prices were abnormally low until the general rise in commodities in the autumn, when cheese prices stiffened. In the first ten months of 1939 production of United States cheese was reported by the Department of Agriculture as 462,788,000lb., or a decline of 8% from 1938 production in the same period. Cheese stocks in the United States Nov. 1, 1939, were the lowest since 1932, or 94,000,000lb., a decrease of 19% in comparison with Nov. 1, 1938. During the war period in 1939 there was little change in cheese exports and imports in the United States. In 1914-15 United States cheese imports averaged 50,000,000lb. annually, or about 14% as large as domestic production. In 1917 and 1918 United States cheese imports averaged 7,000,000lb. yearly and in 1934-38 the average annual imports were 54,279,000 pounds. Cheese exports from the United States rose abruptly during the War 1914-18 to about 12% of domestic production. Cheese shipments from principal exporting countries were reported as in the accompanying table by the International Institute of Agriculture for the first eight months of 1939 and 1938 and for the twelve months of 1938.

(S. O. R.)

Chemical Warfare. The student of chemical warfare is struck by three outstanding facts, as developed from the war in Europe in 1939:

- Failure to employ chemicals in the Polish campaign.
- Failure to employ chemicals in bombing raids on Great Britain, France, or Germany.
- Extent of gas-defence preparation by both the civilian population and military forces.

Poland is reported to have had mustard gas, an ideal defensive weapon, available for use. Effective use of it would have materially slowed up the German advance. This failure may have been due to any one or all of the following factors:

(1) The immediate destruction, or immobilization, of the entire Polish air force at the outbreak of the war, thus eliminating the means of long-range reconnaissance to give information as to routes, strength, and formation of the German advance. It also left Poland no means of bombing or spraying from the air.

(2) Fear of retaliation to a far greater extent than was possible for Polish use. This may be ascribed to the fact that Germany could literally lay down "tons" of chemicals to "pounds" by the Poles.

Germany did not use chemicals because they are unnecessary in a one-sided war where one powerful force quickly overwhelms a vastly inferior force. In a lightning-like advance, similar to that of the Germans, the use of persistent chemicals of the mustard gas type is unnecessary and might be of considerable detriment to a force advancing over a broad front.

The non-use of chemicals in bombing raids may be ascribed in part to the fact that during 1939 the war has been largely limited by diplomacy. Both sides disclaim any desire for war and have tended from the beginning to refrain from any act which would mark them as the aggressor and thus subject them to the opprobrium of the world. While the feeling that chemical warfare is more inhumane than other methods of war is illogical and not supported by facts, that sentiment undoubtedly exists. There may also be the fear of retaliation which would bring real war to the home population before other methods of achieving victory have failed. Again, good strategy does not invite retaliatory attacks prior to ability to make an overwhelming attack on the enemy.

Preparations for gas defence have been quite thorough. The issue of a gas mask to each individual soldier and training of troops in chemical defence are normal to all modern armies. With the development of long-range bombing aeroplanes, it became

Cheese Exports from Certain Countries

	8 mos. 1939 lb.	8 mos. 1938 lb.	12 mos. 1938 lb.
New Zealand	118,239,000*	119,310,000*	180,381,000
Netherlands	78,372,000	85,817,000	128,953,000
Switzerland	32,906,000	30,841,000	49,348,000
Canada	28,138,000*	24,152,000*	80,989,000
Italy	27,692,000	28,171,000	53,286,000
Australia	21,508,000	18,671,000	34,732,000
Denmark	13,298,000	13,060,000	20,406,000
Finland	8,073,000	8,807,000	14,930,000
Argentina	3,031,000	2,295,000	4,365,000
Union of South Africa	2,998,000†	661,000†	2,716,000
Norway	2,727,000	2,332,000	3,642,000
Yugoslavia	1,781,000	1,909,000	3,384,000
Bulgaria	1,109,000	2,121,000	3,660,000
Ireland	794,000	1,146,000	2,262,000
Hungary	500,000	620,000	787,000
Estonia	467,000	273,000	507,000
Lithuania	238,000	895,000	2,004,000
Poland-Danzig	214,000	271,000	500,000
Latvia	214,000*	170,000*	309,000
Rumania	64,000*	97,000*	110,000

*Jan. 1 to July 31, 1939. †Jan. 1 to May 31, 1939.

apparent that the threat of death and destruction was no longer confined to the forward areas of the battle zone. Certain foreign military writers stressed the importance of concentrated attacks by long-range bombers upon cities, manufacturing, supply, or transportation centres well within the zone of the interior. Such attacks could be made by chemical bombs and spray, as well as by high-explosive and incendiary bombs. This real danger to the civilian population at home—the heart of an army—presented a new threat. Consequently, long before the outbreak of the European war in 1939, all of the leading nations of Europe were devoting considerable money, technical skill, and manufacturing effort toward adequate defence preparations for the civilian population. These included the provision of a gas mask for every citizen, gas and bomb-proof inclosures and thorough education of the public in protection against chemicals.

Civilian defence became front-page news during the latter half of 1939. The gas mask was no longer limited to the soldier. Almost every periodical pictured European civilians in all walks of life wearing or carrying a gas mask. The threat of gas warfare being particularly serious to Great Britain, defence preparations were most thorough in the British Isles, and photographs from that country included the King and Queen, other royalty, and factory workers carrying gas masks. The gas mask has become essential for street wear, and dress designers have fashioned gas mask carriers to harmonize with street apparel.

These preparations for defence against chemical warfare are clearly indicative of a real danger. While nations remain secretive about and are reluctant to admit their plans for use of chemicals, it is a fact that all European nations have excellent systems for securing information. None of them would spend the money or effort on gas defence unless they were sure that the potential threat might suddenly develop into a vital surprise attack against them. Probably no single factor is better insurance against enemy attack than complete defensive equipment and training.

Whether or not the hesitation to use chemicals will continue, is a matter of conjecture. Heretofore chemicals have always been used as a last resort when other means have failed. If a quick decision can be gained by their use, before effective retaliation by the enemy, there appears to be no doubt but that they will be used. Necessary factors for use are availability and the means to lay them down in quantity on the desired target. All of the leading powers in Europe are believed to have them. Most effective use requires that chemicals be laid down in quantity against unprotected individuals or as a surprise attack against those with defensive equipment. From reports of war operations in general, it is doubtful that humanitarian reasons have been, or will prove to be, any deterrent.

Chemical warfare is a weapon for industrial nations. The leading nations of Europe are probably well prepared for use of chemicals in war, either offensively or defensively. When and if they are used, it should be expected they will be used in quantities unheard of during the World War. Targets will be literally deluged with chemicals in order to achieve immobilization of enemy troops, aeroplanes, transportation, and centres of supply, manufacture, or other activity. Wholesale destruction of life cannot be secured when effective defensive equipment is available. Even under heavy gas attack, loss of life should be small, and the greatest advantage would be from the resultant confusion, panic, and disorganization of movement and supply.

Chemical Offence.—The trend of development continued to be toward use of chemical and incendiary bombs, and spray apparatus for liquid chemicals. Medium calibre, rapid-firing mortars, often mounted in a track-laying vehicle or truck, are being developed for ground troops. These mortars are essential for establishment of smoke screens to protect infantry from machine gun or

other fire. Incendiary bombs were used effectively against Poland and Finland much as they were used in Ethiopia and Spain. A special thermit mixture in an electron metal container was especially effective. Other developments reported from Europe are a flame-throwing tank and a fast-moving light tank for projection of chemicals. This tank has not been operated under war conditions, but discharges its chemical content upon reaching the vicinity of its target on or near the enemy front lines and is a development from the cylinder which depended entirely upon the wind to carry its contents on to the enemy.

Chemical Defence.—The black-out of cities to prevent accurate bombing at night received actual test under war conditions in Europe late in 1939. The greatest protection to the civil population was assured by education of the public, by the provision of individual gas masks and the erection in cities of convenient bomb-proofs and gas shelters. As a result, civilians of Great Britain, France, and Germany remain quite calm to this threat. While no gas attacks were made on any city, this equipment and education have gone far towards eliminating the hysterical fear and panic which otherwise could be expected.

Gas masks have been much improved as to fit and comfort. The canisters have a reduced breathing resistance and, in addition to neutralizing the toxic war chemicals, are provided with filters for the efficient removal of irritant smoke particles. Air purifiers for collective protection operate like giant gas mask canisters to purify the air, after which it is pumped into bomb-proofs and other shelters to provide ventilation and gasproofing. Mustard-proof clothing and methods of decontamination are necessary means for gas protection. In the United States, efforts have been continued toward providing adequate protection to its army. (See also *ARMIES OF THE WORLD: Chemical Warfare*; *EUROPEAN WAR*; *MUNITIONS OF WAR: Gas.*) (HA. SH.)

Chemistry. Boron Hydrides.—Boron has been regarded as a trivalent element because its common compounds reveal it in this light [boric acid, $B(OH)_3$; boron fluoride, BF_3]. Its simplest hydride, on this basis, should be borine, BH_3 , but actually the simplest known hydride is diborane, B_2H_6 . Schlesinger and Burg of the University of Chicago have given extensive study to the problem of boron hydrides. One reason for interest in this field is the electron structure of these compounds. In borine there are six valence electrons, three from the boron and three from the hydrogens. In diborane the 12 valence electrons are insufficient to permit a pair of electrons to hold each hydrogen to a boron atom and yet leave any for the borons to bind each other. Since the electron-pair type of bond is the one commonly encountered in other compounds, it is a question of wide interest to study substances which must deviate from this general plan.

Schlesinger has demonstrated that borine may have a transitory existence in certain reactions. With carbon monoxide at $100^\circ C.$, diborane changes to borine carbonyl, BH_3CO , a gas which decomposes easily to diborane and carbon monoxide. Trimethylamine reacts with borine carbonyl at room temperature to yield borine trimethylamine, $BH_3N(CH_3)_3$, a stable solid.

The reaction of diborane with ammonia at $-120^\circ C.$ is another reaction wherein the boron atoms separate at some stage of the process. Two molecules of ammonia are absorbed ($B_2H_6 \cdot 2NH_3$) but the evidence seems well established that the compound produced is an ammonium salt of this structure, $NH_4^+(BH_3-NH_2-BH_3)^-$, wherein the boron atoms no longer hold each other. The salt reacts with sodium (in liquid ammonia at -80°) to produce one equivalent of hydrogen per mole of diborane involved. It reacts also with diborane itself to form a volatile liquid, $BH_2-NH_2-BH_3$. The latter reacts with acids to form boric acid, hydrogen and ammonium ion.

Another reaction where the borine fragments from diborane appear as intermediates is with aldehydes, ketones or esters. With acetone, the simplest ketone, the final product is diisopropoxyborine, probably as follows: Acetone, $(\text{CH}_3)_2\text{C}=\text{O}$, adds to one equivalent of borine (from B_2H_6) and forms $(\text{CH}_3)_2\text{C}=\text{O}-\text{BH}_3$. The latter readjusts its atoms to give isopropoxyborine, $(\text{CH}_3)_2\text{CH}-\text{O}-\text{BH}_2$. This substance adds and readjusts itself to a second acetone molecule as before, to produce diisopropoxyborine, $[(\text{CH}_3)_2\text{CH}-\text{O}]_2\text{BH}$. Water hydrolyzes this compound to isopropyl alcohol.

In other reactions, Schlesinger prepared dimethyldiborane and proved that its structure was symmetrical since it reacted with water to produce methylboric acid and hydrogen.

Sodium and Acyl Chlorides.—In the familiar Wurtz reaction, sodium withdraws the chlorine from an alkyl chloride such as butyl chloride, $\text{C}_4\text{H}_9\text{Cl}$, and two butyl radicals unite to form octane, C_8H_{18} . An acyl chloride ($\text{R}-\text{CO}-\text{Cl}$), if treated with sodium, might be expected to yield diketones, $(\text{R}-\text{CO}-)_2$, but it has not been found easy to control this process. Working with larger acyl chlorides wherein the R in RCOCl represents $\text{C}_{11}\text{H}_{23}$ to $\text{C}_{17}\text{H}_{35}$, Ralston and Selby of Armour and Company found that diketones were indeed formed in the initial stages but that continued reaction with sodium yielded a disodium derivative, $\text{NaO}-\text{CR}=\text{CR}-\text{ONa}$, which reacted with more of the acyl chloride to yield diacyl derivatives, $\text{RCOO}-\text{CR}=\text{CR}-\text{OCOR}$.

Carbohydrate Configuration.—Two relatively new reactions of sugars were applied frequently in 1939. One is the oxidation with lead tetra-acetate. This reagent cuts the carbon-carbon bond of a glycol structure ($-\text{CHOH}-\text{CHOH}-$). If the other hydroxyl groups of carbohydrates are protected against such cleavage, as by changing them to ethers or acetals, controlled scission occurs. In this way, H. O. L. Fischer prepared acetone-L-glycerose and acetone-D-glycerose from the 1, 2, 5, 6-diacetone derivatives of L-mannitol and D-mannitol, respectively. Similarly, Hockett has severed the 4-carbon chain of methyl erythroside into 2-carbon units, and the 6-carbon chain of methyl L-fucoside into 3-carbon units.

Periodic acid cleaves the glycol portion of a carbohydrate in much the same way. In the hands of C. S. Hudson this has proved to be a powerful tool for the determination of ring size and asymmetric configuration. Mannose, trehalose, levoglucosan and higher carbohydrates have been investigated in this manner.

Oesper and Deasy have improved the preparation of lead tetra-acetate. They passed chlorine into the reacting mixture of red lead, acetic acid and acetic anhydride. Without the chlorine more lead diacetate is formed than lead tetra-acetate, but with chlorine the latter was the chief product.

Starch and Cellulose.—In spite of repeated attacks on the problem, the bigness of starch and cellulose molecules has remained mostly conjectural. Both are known to be built up exclusively of glucose units, but the question is: how many such units? Wolfrom, Sowden and Lassettre have given a fresh approach to this problem. They treated potato starch or methylated cellulose with cold, fuming hydrochloric acid in the presence of a reactive sulphur-containing compound, namely, ethanethiol. As the acid split the starch or cellulose molecules into smaller units, the ethanethiol attached itself at the point of rupture. Then, at definite time intervals the sulphur content was determined, more sulphur being found with experiments of longer duration. By plotting the results and extrapolating back to zero time these investigators calculated that the starch was composed of 16–24 glucose units and the cellulose of 330–470 such units.

Lignin.—Wood is made up chiefly of cellulose and lignin. For paper, cellulose is the desirable component and lignin is removed. After removal, it is usually discarded, hence the study of this



CHEMICALLY TREATED WATER is the synthetic "soil" in which these nasturtiums are grown; by means of hydroponics or aquaculture, the lack of boron in the flowers' food can be carefully studied

waste material is one of great economic significance.

Two broad approaches to the separation of lignin from cellulose have been in vogue. One method depends on the removal of the cellulose by hydrolysis, leaving the lignin as an insoluble residue. For this purpose resin-free wood flour may be left with 70% sulphuric acid or fuming (42%) hydrochloric acid. The other method depends on the removal of lignin from the cellulose. The sulphite reaction, for example, is commonly employed in paper manufacture. Delignification is induced by heating the wood under pressure with acid sulphites. Water-soluble ligninsulphonic acids are formed. Extraction with alkali, or phenol, or alcoholic hydrochloric acid are other schemes for extracting the lignin.

Hibbert and co-workers at McGill university reported in 1939 on their extensive studies on lignin. Their method of extraction was "ethanolysis," or boiling with ethanol (ethyl alcohol) and 3% hydrochloric acid. Lignin and phenolic substances were in the alcohol solution. The phenolic substance from soft wood (spruce) was shown to be para lacylguaiacol, $\text{CH}_3\text{CHOHCO}-\text{C}_6\text{H}_3(\text{OCH}_3)-\text{OH}$. This phenol was found also in the extract from hard wood (maple) but it was accompanied by a related compound which

differed only in having another methoxyl group, $\text{CH}_3\text{CHOHC}-\text{C}_6\text{H}_2(\text{OCH}_3)_2-\text{OH}$, on the aromatic nucleus. The first of these may be referred to as the "guaiacyl" building unit of lignin and the second as the "syringyl" building unit. Syringaldehyde and syringoylacetalddehyde, $\text{HCOCH}_2\text{CO}-\text{C}_6\text{H}_2(\text{OCH}_3)_2-\text{OH}$, were among the other products identified in experiments with maple wood. Experiments with jute fibre, rye straw and corn stalks also led to the isolation of these compounds containing the syringyl radical. Hibbert concludes that these results indicate the presence of syringyl derivatives in the lignin constituents of all angiosperms, for example in corn or rye as monocotyledons and in jute or maple as dicotyledons. Hibbert regards pyruvic aldehyde CH_3COCHO , as the key substance in the synthesis of lignins, tannins and plant pigments. Reaction of pyruvic aldehyde with guaiacol, $\text{C}_6\text{H}_4(\text{OCH}_3)\text{OH}$, for example, yields hydroxyacetonylguaiacol, $\text{CH}_3\text{COCHOH}-\text{C}_6\text{H}_3(\text{OCH}_3)-\text{OH}$.

In alkaline surroundings this rearranges to lactylguaiacol, mentioned above, which in turn condenses with like molecules to form lignin.

Vitamin B₆.—Another vitamin, associated with B₁ in rice chaff, is B₆. Its identity was revealed in 1939. Vitamin B₆ represents that factor of the vitamin B complex which prevents or cures an acrodynia-like dermatitis in young rats. Also, severe microcytic hypochromic anaemia develops in puppies when the rat anti-dermatitis factor is apparently the only missing component of the diet.

A group of chemists from the laboratories of Merck and Company (Harris, Folkers, Stiller, Keresztesy and Stevens) have not only established the structure of this vitamin but also have synthesized it. The vitamin is 2-methyl-3-hydroxy-4,5-bis(hydroxymethyl)pyridine, $\text{CH}_3(\text{HO})\text{C}_5\text{HN}(\text{CH}_2\text{OH})_2$. Oxidation of the CH_2OH groups to COOH groups, yielding 2-methyl-3-hydroxy-4,5-pyridinedicarboxylic acid, was important evidence in solving the structure. Its synthesis was effected, starting with ethoxyacetylacetone and cyanoacetamide. Kuhn and co-workers in Germany announced the same structure in independent work. Eakin and R. J. Williams and also Schultz, Atkin and Frey have shown that crystalline vitamin B₆ is a growth-promoting factor for yeast.

Vitamin K.—Since 1930 investigators have reported a bleeding tendency in chickens reared on artificial diets. In 1935, Henrik Dam and Fritz Schonheyder of Copenhagen reported that the deficiency factor causing the haemorrhages was a fat-soluble substance. Dam named it vitamin K (*Koagulations-vitamin*). Bio-assay methods were developed by Dam, by Almquist in California and by Doisy in St. Louis. Dried alfalfa leaf meal and putrefied sardine meal proved to be satisfactory sources of K. By 1937, Almquist had perfected a process for extracting the anti-haemorrhagic vitamin from dried alfalfa with hexane.

The use of vitamin K in obstructive jaundice was proposed by Quick of Milwaukee in 1937 on theoretical grounds. Since then it has been established that the bleeding tendency or lack of blood clotting so often seen in patients having biliary fistulas or obstructive jaundice is due to abnormal lowering of the plasma prothrombin level and that usually the bleeding tendency can be relieved by vitamin K therapy.

In 1939 several groups of investigators attacked the chemical side of the problem. Besides Doisy, Almquist and Dam, the groups included Riegel and co-workers of Northwestern university and elsewhere, Fernholz of the Squibb Laboratories, Kuhn of Germany and Anderson of Yale. It was Doisy's group that announced the isolation of crystalline vitamin K from alfalfa extract. By chemical reactions and ultra-violet absorption spectra they established it as a derivative of naphthoquinone. Oxidation experiments showed that it was probably 2-methyl-3-phytyl-1,4-naphthoquinone and this was confirmed by synthesis. The

phytyl group, which is found also in chlorophyll, is $\text{H}-[\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CH}_2]_3-\text{CH}_2\text{C}(\text{CH}_3)=\text{CHCH}_2-$, or simply $\text{C}_{20}\text{H}_{39}-$.

Curiously enough, it was shown that the phytyl group was non-essential for the efficiency of the vitamin. Both 2-methylnaphthoquinone and 2-methyl-3-hydroxynaphthoquinone (known as "phthiocol") possess activities comparable to vitamin K.

Vitamin E.—This anti-sterility factor (as tested with female rats) occurs especially in the unsaponifiable portion of wheat-germ oil, corn-germ oil or lettuce oil. The phytyl group is present in its structure also. L. I. Smith and co-workers at Minnesota have shown recently that here again the phytyl group is not a specific factor, for a considerable number of substances other than vitamin E also display vitamin E activity. This lack of specificity with vitamins E and K is striking since there are no substitutes for the other known vitamins which have been identified chemically. (See also VITAMINS.)

Nobel Prizes.—The 1938 prize in chemistry was awarded in 1939 to Richard Kuhn of Berlin. The 1939 prize was divided between Butenandt of Berlin and Ruzicka of Zurich. Kuhn isolated vitamin B₂ or riboflavin. Butenandt isolated androsterone and Ruzicka first synthesized this male hormone. The 1939 prize in medicine is of interest to chemists also. It went to Domagk for his work on "prontosil," forerunner of sulphanilamide.

(C. D. Hu.)

Chemistry, Applied. As the chemical accomplishments of 1939 parade before us many receive merited applause. The most spectacular are those in the field of pharmaceutical or medicinal chemistry and in the broad field of resins. There have been some notable advances in metals, in glass, in chemicals and equipment for their manufacture, in exploratory work in pure chemistry, and in a number of important miscellaneous items.

Research with derivatives of sulphanilamide goes forward at an accelerated pace stimulated by the success already achieved in the better control—if not the cure—of many diseases. Sulphapyridine and sulphathiazole have come to the aid of the physician in the treatment of the many types of pneumonia, for some of which we have had no serum. Hundreds of derivatives of sulphanilamide have been made and tried, with only a few offering improvements, but those are of vital interest and the search continues.

Synthetic vitamins and hormones have been added to a growing list with vitamin K synthesized very soon after the determination of its structure. Indeed, several groups were engaged in a friendly race in this work. The vitamin is the one responsible for coagulation of the blood, and while inefficient in haemophilia is important in many operative cases. Threonine is one of the proteins essential to the maintenance of life. It can now be synthesized simply and economically, the basic raw materials being coke and water. Its availability promises to be of much importance in nutritional studies. Crystalline insulin was patented during the year, and it was learned that aluminium oxide in very small amounts can prevent silicosis. Further tests in factories where colour matching must be made with precision demonstrated the necessity of vitamin A in maintaining an adequate supply of visual purple to prevent fatigue. It was also learned that a diet of corn sugar or molasses prevents ketosis, a disease which cuts milk production and inflicts economic loss in dairy herds.

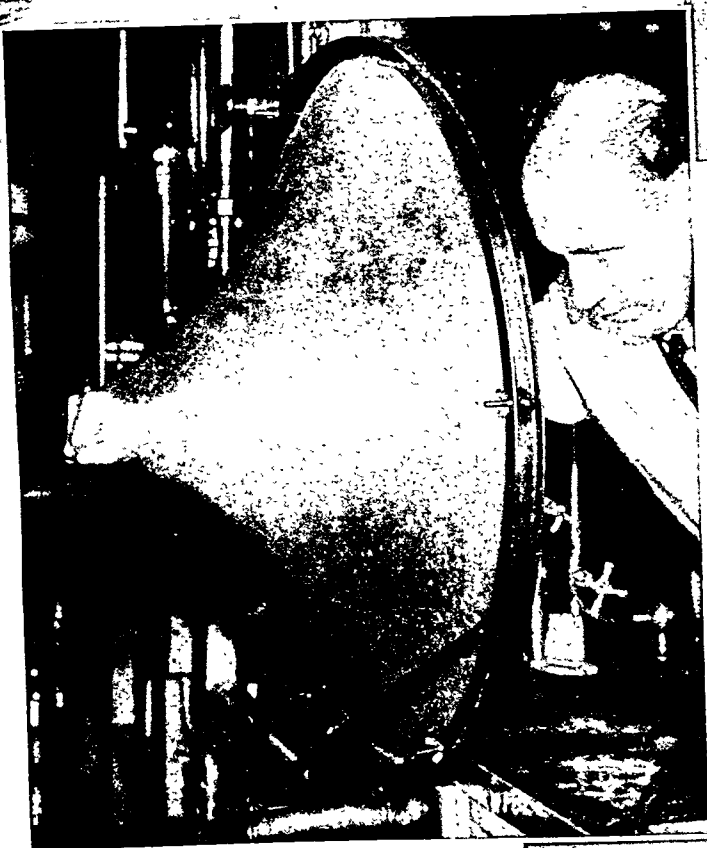
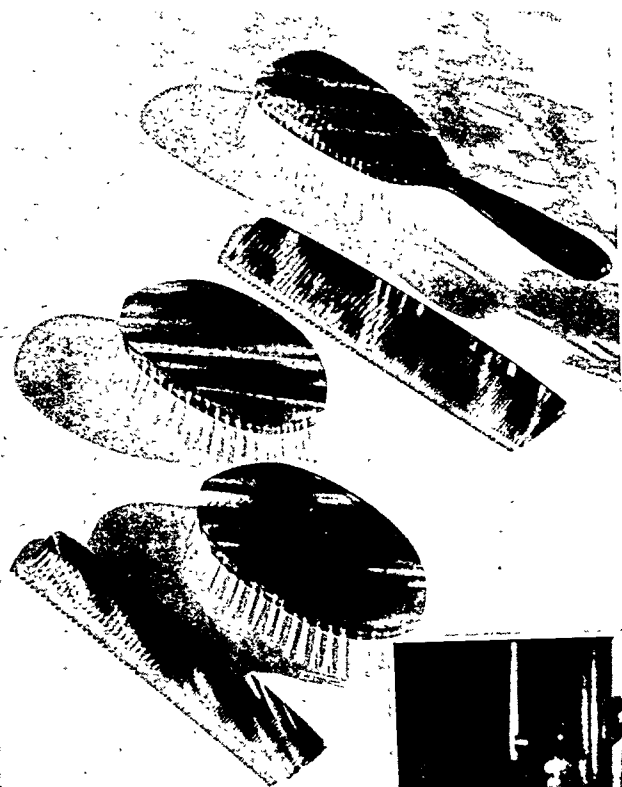
Among advances in preparation and preservation of foods, the "Tender Rayed" process should be mentioned. This is one in which meat can be stored at a temperature sufficient to promote the tendering of connective tissues by enzymes while spoilage is prevented by ultraviolet rays in a carbon dioxide atmosphere.

Cryovac is a designation for a new technique in enclosing meats in a thin rubber pouch which is shrunk under vacuum to fit the contents exactly, thereby preventing freezer burn and undue loss of moisture, with improvement of product after quick freezing.

Three or four advances in the field of resins merit special mention. Nylon, discovered late in 1938, was further perfected during 1939, and some of the first synthetic fibre made its appearance on the market in the form of sewing thread, fishing leaders and lines. Bristles for hair brushes were added to those previously prepared for toothbrushes. The first commercial manufacturing unit began operations on December 15 and the plant was increased some 25% before it was completed. Extensive tests with hosiery made from nylon thread further demonstrated its superiority over other fibres for the purpose, including natural silk. Nylon is made principally from adipic acid polymerized with hexamethylene diamine.

Vinyon is another synthetic fibre, derived principally from chlorine and acetylene. It is thermoplastic and resists acid and alkali to a marked degree. This has made cloth of this fibre desirable for filtration and other industrial uses. It has also found application with cotton in making the first successful cotton felt.

Ethyl cellulose, another new fibre, made its appearance, and improvements in Fiberglas led to the introduction of colour designs and the adapta-



Upper left: "EXTON" BRISTLES made of nylon replaced hog bristles on many new brushes in 1939

Upper right: A NEW PLASTIC, "Lucite," developed in 1939, enables surgical instruments to shed a shadowless white light

Centre: EXTREME FLEXIBILITY UNDER IMPACT is a characteristic of "Butacite," a plastic layer for safety glass which made its appearance on 1940 motor car models

Lower right: "ZELAN," introduced in 1939, makes gowns treated with it resistant to water and spottings of all kinds

tion of the fabric to table cloths, particularly for restaurants where losses of linen due to stains and burns is considerable. Fibreglas continued its advance as an insulating material and for filter cloths. In the latter case it is sintered to maintain pore size.

Special resins to be used with linseed and soybean oil to produce varnishes equal to those obtained with tung oil were prepared, and other resins for bonding mineral and glass wool came on the market. Pigmented resins in water emulsions made possible improvements in textile printing, and experiments for moulding the fuselage and wing parts of aeroplanes from synthetic resins were undertaken. New plastics were prepared from lignin and from bagasse, notable for their low cost.

Another new resin of considerable importance is polyvinylacetyl known as Butvar or Butacite, depending upon the manufacturer. It is characterized by extreme elasticity and its use has made possible a greatly improved Hitec safety glass.

Staybelite is the name of an improved rosin prepared by hydrogenating a rosin already purified by the use of furfural. It brings to the industry a clear, light coloured rosin of permanent colour.

In the field of metals should be mentioned improvements in stainless steel through alloying a small percentage of silver to increase resistance to the corrosion of sea water. Lead alloyed with steel greatly increases its machineability. Processes for working low grade manganese such as found in Cuba and in the United States became important with the outbreak of the European war. Deposits of tungsten were found in Mexico and are refined at a plant in Texas. A new alloy of tungsten, titanium, and carbon, called "Kennametal" and used principally for cutting tools was introduced. A new plating process for black nickel in which the coating is molybdenum and nickel, was introduced under the name of "Moly-black." Iron of extreme purity is now produced in commercial quantities.

The United States Government undertook intensified search for deposits of minerals usually imported and likely to become scarce if the European war is long continued.

Shrunk glass was made by treating moulded forms with acid, dissolving out approximately 50% of the mass, after which reheating caused nearly 50% shrinkage and produced ware with properties similar to those of fused quartz, but much less expensive.

Work continued with the deposition of very thin films on glass to render it invisible, but it has not yet reached the commercial stage. In the field of pure research may be noted the discovery of new reactions by George Calingaert. By the use of certain catalysts, reactions could be promoted at low temperatures and pressures very much as is the case with inorganic reactions. There is no loss through the formation of by-products or wastes such as accompanies ordinary organic chemical reactions and they are indeed metathetical in character. They have a number of applications, including the study of such complex and puzzling reactions as take place in the aging of wine and liquors.

Heavy carbon was produced in quantity by Harold Urey and associates. Uranium and thorium atoms were split by bombardment with neutrons and enormous amounts of atomic energy were released thereby. Lignin was isolated by F. E. Brauns, and E. Segré prepared the missing element No. 43 by bombarding molybdenum with deuterons or with neutrons.

A. K. Brewer and A. Bramley developed a new process for the separation of isotopes employing distillation. (See ISOTOPES, SEPARATION OF).

Since the outbreak of the European war 108 technical and chemically pure chemicals, imported prior to September 1, have been made in satisfactory quantity in the United States. A plant was built for the manufacture of synthetic salt cake to supply kraft mills with this raw material. Originally salt cake was a by-product of the old method of manufacturing nitric acid from Chilean nitrate. More recently it has been imported from Europe. Another domestic source is the rayon industry where the sodium sulphate is formed in the acid setting baths. Certain natural deposits are now being worked.

Potash production was expanded in the United States and plans made for the further working of the potash minerals occurring in the Southwest.

By the nitration of paraffin hydrocarbons a new family of chemical compounds was prepared for industry and their commercial production undertaken. These promise much in the way of solvents, gelation agents and other reagents, hundreds of such nitroparaffins being possible.

Wetting agents found additional applications in shampoos and in dentifrices, and Sopanax, an amino derivative, was offered to prevent soap from becoming rancid and discoloured while waiting on the shelf.

Ethylene glycol, heretofore produced by a single manufacturer, now is made by two others in addition.

Santocel is a new form of silica of very low density, used where bulk without material addition to weight is required—as insulation material and for a number of other purposes.

It was found that a good absorptive charcoal can be made from pecan shells.

New processes found employment for the production of new types of aviation gasoline, and at least two new processes went into commercial production for the manufacture of petroleum products more nearly to specifications than have heretofore been possible.

There was considerable expansion in the production of dehydrated castor oil to take the place of Chinawood or tung oil, imports from the Orient having declined substantially because of the war in China. The tung oil groves in the southern part of the United States had larger production than heretofore with more trees reaching the nut bearing stage.

Santomask, a derivative of vanillin, now made in increasing quantities from waste sulphite liquor, was devised to obscure the odour of fresh paint and found approval, particularly for inside work.

Zelan is a new process for so treating textiles as to increase their resistance to water spotting and stains, and synthetic resins were more extensively used for finishing various textile fabrics.

The sink-and-float process, whereby coal can be accurately separated from non-combustible materials mined with it, was installed commercially for the first time.

Reports were made on the application of methods similar to those used in air-conditioning to the curing of tobacco, resulting in lower costs and improved quality.

The paper mill set up in 1938 to manufacture cigarette paper in the United States performed its work satisfactorily and the output was increased. A mixture of flax grown in the different parts of the United States, and harvested primarily for seed, constituted the raw material of such paper, heretofore imported from France.

At Lufkin, Texas, the first paper mill to make newsprint from southern woods was erected.

A rubber filter cloth, desirable in the chemical industry, was produced. Electro-forming, a new process for building up moulds, such as those used in tire manufacture, was announced and an all-glass pump of commercial capacity was put on the market.

Carbon bricks for lining chemical equipment, high pressure valves, and other similar apparatus were improved.

The foregoing items cannot be said to be all inclusive but they at least indicate a very healthy condition of chemistry in the United States. In the last quarter of a century world leadership has been transferred to the U.S. and with it a greater responsibility. (See also CHEMISTRY AND ENGINEERING, AGRICULTURAL, U. S. BUREAU OF; CHEMURGY; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY; VITAMINS.) (H. E. H.)

Chemistry and Engineering, Agricultural,

U. S. Bureau of. One of the results of reorganization in the U. S. Department of Agriculture in 1939 was the formation of the Bureau of Agricultural Chemistry and Engineering. This bureau includes the chemical and chemical engineering research of the former Bureau of Chemistry and Soils and the research on farm structures, farm mechanical equipment, processing of farm products, rural electrification, and farm operating efficiency of the former Bureau of Agricultural Engineering.

The four regional research laboratories provided for by the 75th Congress, for research on the industrial utilization of farm commodities, and now under construction at Philadelphia, New Orleans, Peoria, and San Francisco, are administered by this new bureau. Because of the frequent, close relations of chemistry and engineering work in agriculture much advantage is expected to result from the integration of research in these two fields.

In addition to work done on regular funds, considerable research was carried on during 1939 with funds provided through the Bankhead-Jones law. In the limited space allotted here it is possible to do little more than list some of the present results attained during the fiscal year ending June 30, 1939.

Ethylene gas was shown to be useful in producing rapid ripening or curing of combine-harvested wheat.

Changes in the apparent quality of eggs were demonstrated to be due in part to handling in the operation of candling and to agitation in transportation, a fact that has a bearing on arguments between shippers and receivers.

Reasons have been found for changes produced in flour by aging, bleaching, and by "bread improvers."

Improvements were made in the process of making starch from sweet potatoes. Material of possible value as an insecticide was found in the fruit of the Amur cork tree; by a new process galacturonic acid, of medicinal value, can be made at 10¢ a gram, whereas the present price is \$2.50 a gram.

Under a patent covering the use of phenothiazine as a urinary disinfectant several licences have been issued to large pharmaceutical houses.

Research on naval stores problems brought a simplified gum-cleaning process and other chemical engineering improvements in this industry, as well as facts of importance to industries using rosin and turpentine.

Investigations of allergens brought out additional facts having a bearing on the sensitivities of people to substances in cotton seed and cotton linters. The antigens in the linters and in the kernel of the seed were shown to be unrelated and it was shown that such substances in the dust from upholstery and furnishings do not all come from cotton linters. It was found that persons sensitive to cottonseed are not affected by refined or refined and hydrogenated cottonseed oil.

Changes brought about in farm practices in growing and harvesting sweet potatoes for starch production are expected to result in greater yields at lower cost, and a process for dehydrating the sweet potatoes for starch gives promise of making starch manufacture from this crop feasible throughout the year.

A new process of making sugar from sorghum may make a new sugar crop available over a wide area, while at the same time new results point to better yields and lower cost in the production of cane sugar.

A method of solvent extraction of tung oil is expected to increase the yield of oil from the nuts.

Protein and nutrition studies showed that the proteins in stored corn meal and soybean meal lose some of their nutritive values, and aging of wheat and corn kernels and soybean seeds resulted in protein changes of less degree.

Improvements were made in the mould-fermentation method in making gluconic acid; new derivatives of fatty acids were developed; varnishes were made from soybean oil and mixed resins as replacements for tung oil in varnish; and laminated paper board was made with the use of soybean meal treated with formaldehyde.

A publication was issued on motor fuels from farm products. Several developments were announced in the field of farm mechanical equipment, including a distributor of poison bait for grasshopper control,

sulphur burner to sterilize soil in greenhouses and mushroom houses, variable-cut toppler for sugar beets which may be useful on beet harvesters, and a combined fertilizer distributor and seed planter.

Studies on cotton ginning brought out possibilities for improvement in such equipment as gin saws, roll boxes, piping systems, an improved fan and means of using cheaper sources of heat for drying cotton. Reports indicate that 1,100 cotton driers, using the process developed in the bureau, were in operation during 1939.

In the Northwest work was done on flax processing, resulting in the development of a more efficient tow shaker and a better flax deseeding.

Work was started during the year on uses of electricity on the farm and some preliminary results were obtained on the use of electric light traps for the European corn borer.

Chemical engineers of the bureau reported much wider adaptation of dust explosion prevention practices and collaborated in the development of safety codes for fire and explosion protection in country grain handling plants, in plants handling sulphur, and in those manufacturing fertilizers and insecticides. They also showed that static electricity and dirty seed cotton are the chief factors in causing cotton gin fires.

Structural engineers of the bureau announced the possibility that both summer and winter comfort in farmhouses may be brought about by the use of walls permitting maximum ventilation in the outer part and preventing penetration of the air through the inner part. They also brought out new facts on the control of moisture in stored ear corn and small grains, and emphasized the importance of basing ventilation requirements on prevailing local temperatures and humidities. New facts were brought out on crib designs, and two types of portable grain driers have been developed and tested. (See also CELLULOSE PRODUCTS; CHEMISTRY, APPLIED; CHEMURGY; INDUSTRIAL RESEARCH.) (H. G. K.)

Chemotherapy. As in 1938, so in 1939 sulphanilamide was the chief therapeutic drug of interest. Experimental evidence shows that the product has a chemotherapeutic effect in infections produced by the meningococcus, gonococcus and *Clostridium welchii*, and that it is of value in the treatment of certain diseases of the urinary tract, notably those due to *Bacterium coli* and *Proteus vulgaris*. Some startling reports have been made concerning its value in the treatment of trachoma, a disease long associated with the Indians.

A new derivative, sulphapyridine, made its advent in American clinical circles the early part of 1939. Sulphapyridine has shown itself to be very effective in the treatment of pneumonia—much more so than sulphanilamide. Therapeutic successes have also been reported following the use of sulphapyridine in the treatment of pneumococcal lobar and bronchial pneumonia, gonococcal, staphylococcal, meningococcal, and streptococcal infections. The evidence of its effectiveness is convincing only in respect to its use in pneumococcal infections and in the treatment of gonorrhoea. The drug has toxic reactions and therefore no patients should be treated with it unless arrangements have been made for daily attendance by a competent physician.

Until recently there was no oral bismuth preparation which was effective in the treatment of syphilis. Hanzlik, of Leland Stanford university, made a preliminary announcement in 1936 that a complex preparation formed by the interaction of sodium bismuthate, triisopropanolamine and propylene glycol was sufficiently absorbable to maintain a satisfactory bismuth level in the blood stream. Though it does not displace the intramuscular use of bismuth preparations, it provides a method of treating those patients who may be forced to travel or for whom the intramuscular use of bismuth preparations is interdicted.

Continued interest in the manufacture of insulin led to the development of a purified product which is now being marketed in the form of a solution of zinc insulin crystals. This gives rise to the possibility of ultimately placing the assay of zinc insulin solution on a weight basis rather than relying solely on biological assays.

Testosterone—known as the male sex hormone—has been marketed for a few years in the form of testosterone propionate. The class of female sex hormones, known as estrogens, has opened more promising prospects. The naturally occurring ones are estrone (theelin), estriol (theelol), and estradiol, the last named of which is generally manufactured synthetically. In the hands of competent physicians they have been found to be of benefit in the treatment of certain manifestations associated

with women who are estrin-deficient, particularly during the menopause, and for the treatment of vulvovaginitis in young girls. On the other hand, such potentially active products must receive careful regard by those who are using them. Competent investigators are pointing out the possibility of hazards which may follow the long continued use of these preparations, particularly in persons who may not be estrin-deficient. A rather startling development has been the discovery of certain synthetic preparations, in no way related chemically to the native estrogens (which are generally a cholesterol type of preparation) but which have extremely active estrogenic effect. The best known of these is stilboestrol (diethylstilbestrol—4:4-dihydroxyalpha: beta-diethyl stilbene). Investigations by equally good workers using stilboestrol for treatment of estrogen deficiencies have been inconclusive. All agree that the product is highly estrogenic and has many advantages over native estrogens, particularly as it may be given orally and is much more reasonable in cost. But there is lack of agreement concerning the toxicity of reactions.

Because of the Chinese-Japanese war the supply of ephedrine from China has been greatly curtailed. American pharmaceutical manufacturers have met this shortage by manufacturing a racemic form of ephedrine, called racephedrine, which seems to be equally satisfactory with the official laevo ephedrine except that it must be given in somewhat larger amounts for the same dosage effect.

Intensive research during the summer of 1939 was particularly noticed in the field of vitamin K. Doisy and his associates had confirmed through synthesis the structural formula of vitamin K, demonstrating conclusively that it is 2-methyl-3-phytyl-1,4-naphthoquinone. This work has been further confirmed by that of others. Vitamin K is generally administered in association with bile or bile salts in the treatment of patients suffering from haemorrhagic diseases due to the lack of adequate factors to control the coagulation of the blood. It has also been found that certain closely related synthetic compounds have anti-haemorrhagic properties.

The vitamin B complex has been the most interesting group of the vitamin family. It has been found that nicotinic acid, particularly in association with vitamin B₁, or thiamin chloride as it is better known, is practically specific in the treatment of human pellagra. Manufacturers in the United States have developed vitamin B₆ (pyridoxine hydrochloride), which at the close of 1939 was not yet licensed for sale in interstate commerce. Vitamin B₆ apparently is of some value in certain types of nutritional dermatosis, at least in animals. The most widely used of the vitamin B class of compounds, is thiamin chloride. This vitamin is frequently removed in certain types of milling processes. There have been suggestions made that because of this, the dietary of many Americans may be deficient in thiamin and certain food manufacturers are putting forth efforts for reconstructing certain foods by the addition of this chemotherapeutic agent. (See also PNEUMONIA; UROLOGY; VITAMINS.) (P. N. L.)

Chemurgy. The application of chemistry to the expanded consumption of farm-grown raw materials for other purposes than food and clothing advanced measurably during 1939. Plant capacity for processing soybeans increased several million bushels. The first large-scale mill to utilize Southern pine for newsprint was completed in December at Herty, Texas, with an investment of more than \$6,000,000, and its output contracted for in advance. A privately financed sweet potato starch factory began operation at St. Francisville, La.

Under construction and to be completed during 1940 were the four regional research laboratories for which Congress has appropriated approximately \$4,000,000 a year to seek industrial and non-food uses for surplus farm products. The sites, areas, and

products to be studied are as follows:

Peoria, Ill., for the Northern area including Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Ohio, Wisconsin, and Michigan. Corn, wheat, and agricultural wastes will be the principal research subjects.

New Orleans, La., for the Southern area including Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina, and Texas. The principal products to be studied here are cotton, sweet potatoes, and peanuts.

Philadelphia vicinity for the Eastern area, including the New England and Atlantic States with North Carolina, Tennessee, Kentucky, and West Virginia. Tobacco, apples, potatoes, milk, and vegetables to be studied.

San Francisco vicinity for the Western area, including Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. Studies to centre on fruits, vegetables, potatoes, wheat, and alfalfa.

The chemurgic program may briefly be described. Although agriculture is primarily a food-producing enterprise, the inelasticity of the human stomach definitely limits the market for food products. The loss of export markets and other factors resulted in agriculture being confronted with a capacity for production greater than its ability to sell.

Aware of the fast-growing science of organic chemistry and its ability to convert organic materials into substances in wide demand, a few students of the agricultural situation began several years ago to hope that chemistry might eventually produce important markets for farm materials.

The first proposals for serious consideration of the idea were made on the editorial page of *Farm & Fireside* in 1926. It was pointed out that farmers are producers of starch, sugar, proteins, cellulose, vegetable oils, and other items which are raw materials for the organic chemist, and that industry might find in the annually renewable gifts of the soil its most favourable supplies of raw materials.

The term chemurgy was first applied in 1935, when it was coined by Dr. William J. Hale, an organic chemist. Dr. Hale pointed out that except for a 2% or 3% content of minerals actually extracted from the soil, all plant growth is simply moist air transformed by sunshine into solid substance; and that, therefore, wealth-producing potentialities are virtually unlimited, in addition to being independent of the irreplaceable characteristics of mineral deposits.

While few of chemurgy's proponents have ever maintained that it was more than one sound approach to the agricultural problem which obviously would advance slowly, developments during 1939 appeared to indicate that it may have a large share in the eventual enlargement of agricultural income.

The basic idea of chemurgy is to advance the utilization of farm materials in industry, mainly for inedible and non-wearable consumption, through (a) new uses for present crops; (b) new crops for new or established uses, and (c) profitable markets for wastes.

The tonnage of non-marketable farm wastes grown each year has been estimated to equal the quantity of products that are sold. The weight of fodder and straw is as great as that of salable corn and cereal grains. Other wastes are cotton stalks, cull fruits and vegetables, poultry feathers, nut shells, and others of minor importance.

Announcements were made during 1939 of the appointments of official State Chemurgic Commissions by the governors of Ohio and Missouri. The Commissions are charged to study the utilization within their respective States of agricultural materials for other than food purposes, to discover opportunities for enlarged farm production in such directions, and to recommend constructive steps to the State Governments. Similar commissions under other names exist in Arkansas, Mississippi and Vermont.

Three State Teachers' colleges in Texas and Centenary college at Shreveport, La., established study and laboratory courses in chemurgy during 1939. As a laboratory exercise an issue of the school newspaper at Sam Houston State Teachers' college, Hunts-

ville, Texas, was printed on paper made by students from fibre of castor bean stalks.

A feature of 1939 was the 80,000,000bu. crop of soybeans (up from 57,000,000bu. in 1938) which again moved into markets at prices more satisfactory to farmers than those brought by any other major crop. Increasing quantities were consumed in paints, plastics, and for other industrial uses.

The successful expansion of soybeans strengthened the demand of farmers and chemurgic leaders that research looking to further new crops be accelerated. The fact that the soybean industry is largely a growth of the last 20 years gave emphasis to the belief that other new crops could advantageously be added to the agricultural economy and substituted on acreages now contributing to surpluses of the older staples. The annual importation of 2,000,000,000lb. of oils and fats was suggested to indicate one of several opportunities for farmers to produce for markets already established in the United States. Shortages of many materials for which normal shipping conditions were dislocated by wars abroad sharpened interest on the part of manufacturers in domestic farm sources of supply.

Research into the practicability of alcohol from farm-grown materials as a supplement to motor fuels made slight progress during 1939. Business difficulties and lack of funds closed down the experimental plant at Atchison, Kan. Further research is anticipated in this field, as well as into starch engines, and other approaches to a fuel market for farmers are expected when the regional laboratory at Peoria is opened.

Newly exhibited during the year were a fast-drying paint made from dehydrated castor oil, and fabrics made from both soybeans and casein. The casein fabrics are efforts to improve upon processes lately developed in Italy where the wool shortage has encouraged the use of substitutes. The protein of soybeans is used, in a process similar to rayon manufacture, to make a yarn that resembles wool.

Increased quantities of soybean materials were consumed in automobile parts, plastics, paints, enamels, stearic acid, glycerin, forleathin, and in foundry cores. The largest tonnage increase for domestic consumption, however, was probably for a food use in vegetable shortenings. A heavy export demand developed in the last quarter of 1939. Plastic, paint, and numerous other further uses were studied in several industrial laboratories and at the U.S. Soybean Industrial Products Laboratory at Urbana, Ill.

Chemists displayed marked interest in castor oil which, due to a unique quality of molecular structure, is believed to have an important industrial future. Farmers in several States, notably in Texas, planted test acreages of castor beans, with results generally indicating an agriculturally profitable crop.¹ Further investigations of the castor bean stalks fibre were conducted, and also of ricinine, an element in the plant which is toxic to insects.

Opening in September at Brevard, N.C., was a large plant which is manufacturing cigarette paper at the rate of a carload and a half per day. This was formerly a French industry. The North Carolina factory employs 700 persons. The raw material used is flax fibre, the product of the Imperial valley in California being blended with other fibre grown in southern Minnesota.

Growing recognition of the popular appeal of chemurgy appeared when the State fair organizations of Ohio and Texas set aside large display areas for exhibits of products manufactured from farm raw materials. Smaller displays attracted attention at other State fairs, county fairs and Grange meetings.

Of promise for the future was the experimental development during 1939 of plastic materials in large sheets. Hitherto satisfactory plastics have been made only in single pieces of relatively small size. During the year 1939 plastic automobile body parts

¹Preliminary experiments with harvesting machinery.

and aeroplane fuselages have proved successful in preliminary tests. Advances toward plastics of lignin, which comprises 25% of all woody plants as the "cement" between cellulose cells and has been wholly a waste, were recorded in laboratories. (See also CHEMISTRY, APPLIED; PLASTICS INDUSTRY.)

The headquarters of the National Farm Chemurgic Council, Inc., the organization devoted to furthering chemurgy in the United States, are at 50 West Broad Tower, Columbus, Ohio.

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Chess. Chess moved its scene of battle because of the war in Europe to South America and Russia, aside from several important tourneys staged in the United States. The International Chess Federation championship in Buenos Aires was formally opened by President Ortiz, of Argentina, surrounded by his cabinet and diplomatic corps. Playing for the Hamilton-Russell trophy, emblematic of the world's championship, the absence of the United States team, three-time winners, brought in Germany as the winner; Poland second, and Estonia third. Capablanca, playing for Cuba without losing a game, won the gold medal for his record of six wins and five draws in the final.

For the championship of the U.S.S.R., Mikhail Botvinnik regained his title during a remarkable display of skill and stamina against 17 of the Soviet Union's strongest masters, defeating Komsomol Kotov, recognized as the master of the Russians. In the great Russian Master's Training tournament begun in Leningrad and finished in Moscow, Salo Flohr, of Czechoslovakia, captured the first prize by one and a half points ahead of Samuel Reshevsky, the United States champion. Dr. Max Euwe won the British Chess Federation tournament at Bournemouth, England, clinching first place in the last round without risking a solitary move.

The North American championship for 1939 drew 28 entrants, with the crown going to Reuben Fine with a superior mixture of wins and draws, leaving behind him S. Reshevsky and I. Horowitz. This was the 40th annual tourney, held under the auspices of the American Chess Federation. In capturing this title, Fine added to his glamorous victories in 1932, 1933, and 1935, besides sharing the crown with Reshevsky in 1934. Arnold Denker won a hard fought last round draw from Albert S. Pinkus in the New York State championship tourney, enabling him to repeat his title-taking conquest of 1938. The two important New York tourneys: the Marshall Chess club won the championship of the New York Metropolitan Chess League, defeating the Manhattan Chess club. For the championship of the Marshall Chess club there was a tie for first place between Sidney Bernstein and Milton Hanauer, both recognized as among the best players in the United States. A bounteous harvest of exciting chess was produced by the Ventnor City, (N.J.) invitation chess tournament, as 12 well-chosen competitors squared off. After an uphill struggle, Milton L. Hanauer topped the list with the best total score. In the Intercollegiate Chess League the contest was especially close, with City college clinching premier honours on the last day of the tournament. In the Yale-Harvard-Princeton-Dartmouth group, Harvard made a clean sweep, winning possession of the Belden-Stephens trophy.

The City of Boston title was won by Weaver W. Adams, giving him two legs on the George Sturgis cup. Of prime interest to chess players is the merger of the National Chess Federation and the American Chess Federation, forming the United States of America Chess Federation, of which George Sturgis is the first president. (J. B. P.)

Chicago, American city, port of entry, county seat of Cook county, Ill., is situated at the south-west corner of Lake Michigan. It is the second city of the United States in population, manufactures, and volume of trade. It is the largest centre of rail traffic and of air traffic and is a port for a great tonnage conveyed by lake ships, principally bulk cargoes of iron ores, fuel, and blast furnace flux. It has access by the Illinois waterway to the inland navigation routes of the Mississippi valley. Small steamers make direct ocean voyages to and from Chicago via the St. Lawrence river and the Welland canal.

The population of the city proper at the last Federal census was 3,376,438 inhabitants; that of the entire metropolitan area (1,119.29 sq.mi.) 4,364,755.

Chicago enjoyed a general improvement of business in 1939, the most marked feature of which was the long-delayed revival of the building industries. Lagging far behind most other American cities in 1938, Chicago's 1939 gains were outstanding. Total construction in the metropolitan area was close to \$160,000,000 in value. Residential building valued at more than \$60,000,000 was more than double that of 1938.

Building in the suburbs far outpaced building within the corporate limits of Chicago. Because of the demolition of buildings in the "blighted areas" adjacent to the downtown business centre of Chicago, more buildings were razed than were built in the city in the ten years after 1929, the city suffering a net loss of 9,300 structures.

The year 1939 was the first in which the number of structures erected exceeded the number of those torn down. Some buildings demolished were large commercial structures which included the first steel frame buildings ever erected. They were wrecked because of obsolescence that made it impossible to meet the higher taxes. But in 1939 the famous Masonic Temple building, once the highest office building in the world, was taken down because of the expense that would have been incurred in order to adapt its foundations to conditions created by the boring of the new State street subway. As a result of all these demolitions the number of motor parking lots has increased so that the central part of Chicago has taken on a new aspect, with some buildings mere islands surrounded by streets and parked automobiles.

At the end of 1939, 2.7mi. of the new subway system had been excavated—35% of the 7.7mi. now under construction. Plans call for the operation of trains by Jan. 1, 1941, but in the meantime negotiations for the co-ordination of existing surface, elevated, and motor transit lines have bogged down and the courts have been helpless to untangle the skein of conflicting interests.

Chicago's 1940 budget called for total appropriations of \$164,844,502 for the city government including \$70,706,560 for schools, and appropriations for parks and sanitation under the jurisdiction of independent administrative bodies.

Despite business improvement, the burden of unemployment remained heavy in 1939, and there were periods of critical distress among families dependent upon public relief. The number of persons dependent on locally financed relief declined from 269,019 in June to 229,305 in November as a result of more employment.

Mayor Edward J. Kelly, Democrat, was elected to a third term as mayor in the municipal election of April 4. It is his second elective term, he having been chosen by the city council to fill the vacancy caused by the assassination of Mayor Anton J. Cermak in 1933. Mayor Kelly polled 822,469 votes to 638,068 for his Republican opponent, Dwight H. Green, former U.S. District Attorney, who convicted Alphonse Capone of income tax evasion. In the preceding municipal primary election on February 28, Mayor Kelly polled 604,190 votes for the Democratic nomination to 317,054 by his opponent, State's Attorney Thomas J. Courtney. In the Republican municipal primary of the same date, Dwight

H. Green polled 212,011 votes to 62,540 received by his opponent, former mayor William Hale Thompson.

During the year, State's Attorney Thomas J. Courtney made progress in the effort to curb crime, sending 1,024 criminal defendants to State prisons, 442 to county and city prisons, and placing 339 on probation. Three were executed.

Convictions in burglary cases tried were secured in 93% of the cases, and in 91% of armed robbery cases, with the following percentages for other classes of crime:—embezzlement, 94; manslaughter, 57; sex offences, 73; murder, 74; receiving stolen property, 83. Convictions in jury trials amounted to 51%, in non-jury trials 87%.

During 1939, 15 indictments were obtained against officials charged with election frauds, and a member of the City Council, Frank E. Konkowski, was convicted of the "sale" of a position on the police force.

In the municipal courts, however, efforts to curb public gambling did not meet with similar success and only 12 persons out of 7,400 arrested on charges of public gaming were convicted. The total number of persons charged with offences other than violations of traffic rules, in the municipal courts, dropped from 31,699 in 1938 to 21,623 in 1939.

The year in Chicago was marked by investigations of the Department of Justice into charges of income tax evasion by persons reputed to be in receipt of huge incomes from gambling enterprises. Several indictments were returned.

Charges made against two judges of the municipal court were under investigation by the Chicago Bar Association at the end of the year. Only one spectacular "gang killing" occurred in 1939, the unsolved murder of Edward J. O'Hare, president of a race track and associate of many characters prominent in the gang wars of the prohibition era. (L. H. L.)

Chicago, University of. An institution of higher education and research in Chicago, Ill., founded in 1890. Privately endowed, the university is co-educational and non-sectarian, although not less than three-fifths of its trustees must be members of Christian churches, and a majority of the three-fifths must be members of Baptist churches.

During the summer quarter, 1939, 4,098 students were enrolled in the university, of whom 2,063 were men and 2,035 were women. The total enrolment for the academic year 1938-39 was 12,520, which was an increase of 800 over the previous year. The Home Study (correspondence) department had an average enrolment of 3,684, which is exclusive of the totals given above. The university granted 1,768 degrees during the academic year; 497 were Master's degrees and 178 were Doctorates of Philosophy.

The total funds held by the university as of June 30, 1939, amounted to \$125,835,441, a decrease of \$410,923 over the same figure for the same date in 1938. These funds were divided as follows: Endowment, \$70,944,248; plant, \$44,436,453; other funds, \$10,454,740.

The total income of the several divisions of the budget was \$8,375,444, an increase over the income of the previous fiscal year of \$160,428. This total of budget income does not include income of auxiliary enterprises such as residence halls, commons, bookstores, and student social facilities, nor restricted expendable gifts. Including such income, the total current income for 1938-39 was \$10,567,953.

The total amount of gifts paid in was \$1,308,672.

The libraries added approximately 39,000 volumes raising the total to 1,271,296. President, Robert Maynard Hutchins, LL.D.

Chicago Subway: see CHICAGO; ELECTRIC TRANSPORTATION: *Rapid Transit.*

Child Labour. The year 1939 was the first full year during which the Fair Labor Standards Act of 1938 was in effect¹ in the United States. This act, by establishing nation-wide standards higher than those operative under most State child-labour laws, marks a very significant advance in the protection of children from industrial exploitation. It establishes, for the employment of children and young persons in industries producing goods for interstate or foreign commerce, a basic 16-year minimum age, allowing limited employment of children between 14 and 16 years only in non-manufacturing and non-mining occupations if and to the extent such occupations have been determined by the Chief of the Children's Bureau not to interfere with their schooling, health, and well-being. In addition, it establishes an 18-year minimum age for work in occupations which may be found and declared by the Chief of the Children's Bureau to be particularly hazardous or detrimental to health or well-being. It also sets minimum wages and maximum hours for all workers, regardless of age, in industries producing goods for shipment in interstate or foreign commerce or engaged in such commerce.

The administration of the child-labour provisions of the act, which is placed in the Children's Bureau of the U.S. Department of Labor, has been based on a policy of establishing co-operative relationships with the agencies in the States administering State child-labour laws and of strengthening State administrative systems. The act made this possible by providing for the utilization, with their consent and co-operation, of the services of State and local agencies administering State labour laws, and by recognizing a certificate of age issued according to regulations prescribed by the Children's Bureau as evidence that the minor is of legal age for employment. The wide use of employment certificates in the States as a fundamental procedure for the enforcement of State child-labour laws made it possible in most States to accept State employment certificates as evidence of age of minors under the Federal Act, through co-operative agreements which in many cases resulted in the raising of State standards. Thus, the setting up of dual systems of administration by State and Federal Governments has been avoided and a foundation has been laid for a more effective attack on child-labour problems throughout the United States than has ever before been possible.

Following the ratification by Congress in 1938 of the International Labour Organization convention fixing a minimum age of 15 years for employment at sea, a bill drafted to implement this convention was introduced in the Senate on Aug. 5, 1939. This bill sets for employment on American vessels a general 16-year minimum age, an 18-year minimum age in the more hazardous types of employment at sea, and makes provisions for administration through the requirement of proof of age.

Advances were made in child-labour legislation in a number of the 44 States whose legislatures met in regular session. Two States (West Virginia and Massachusetts) and Hawaii and Alaska adopted a basic 16-year minimum age, the application of the law in Alaska being restricted to girls. Legislation improving hours-of-labour standards for young persons was passed in West Virginia, Massachusetts, Hawaii, and Alaska. Other new State and Territorial laws strengthened the legal provisions for employment-certificate issuance, for compulsory school attendance, for the work of children in street trades and in industrial home work, regulated wages of women and minors, and made provision for the development of apprenticeships. By 1939, 12 of the 48 States of the United States had established 16 years as the basic minimum age for employment: Ohio and Montana more than 20 years ago; Wisconsin and Utah in 1933; Connecticut and Pennsylvania in 1935; Rhode Island and New York in 1936; North Carolina and South Carolina in 1937; and Massachusetts and West Virginia in

¹Act approved June 25, 1938; effective Oct. 24, 1938.

1939. In all these States except Rhode Island the legal minimum age had previously been 14 years. There has been no addition in recent years to the very small group—California, Maine, Michigan, and Texas—which for some years has had a 15-year minimum age.¹

Current figures are not available for the nation as a whole as to the number of working children under 16 years of age. The last census (1930) showed somewhat less than 200,000 employed in non-agricultural occupations and somewhat more than 450,000 in agriculture. These figures represent a decline of 67% in agricultural child labour and 65% in non-agricultural child labour since 1910. Available figures indicate that this decline has continued since 1930.

The last report of the British Ministry of Labour, May 1939,¹ gives the estimated number of boys and girls under 16 years of age, insured under the Unemployment Insurance Acts, who were employed in Great Britain in 1938 in occupations other than agriculture, as 469,000 boys and 386,000 girls, or a total of 855,000. This is less than in 1937 (896,000) and in 1936 (930,000). Of the number estimated for 1938, 229,420 were employed in the distributive trades alone, 45,930 in the textile trades, and 29,640 in coal mining. A departmental committee reporting in 1937 on employment of young persons under 18 in unregulated occupations, outside of agriculture and domestic service, estimated at least 125,000 in such occupations.²

Legislation restricting hours of labour of young persons, becoming effective in Great Britain in 1939, has materially raised the standards for young workers. The Factories Act (1937), effective July 1, 1939, reduced the hours of work of young persons 16 and 17 years of age in factories to 48 a week, and for those under 16 to 44 a week. The Young Persons (Employment) Act (1938), which became effective on Jan. 1, 1939, regulated hours of employment of young workers under 18 in a range of occupations previously not covered by legislation, including the collection and delivery of goods and employment in messenger service in connection with hotels, clubs, newspaper publishing plants, places of amusement, and other establishments. The maximum work week is set at 48 hours for young persons under 18 (44 hours for those under 16 after Jan. 1, 1940), and provision is made for rest periods and a weekly half holiday. The Shops Act (1912 to 1936) was also amended in 1938, providing that beginning Jan. 1, 1940 working hours of children under 16 in shops are to be reduced to 44 a week, subject only to averaging of hours during the Christmas fortnight. The Education Act (1936), which raised the school-leaving age from 14 to 15 years, would have gone into effect Sept. 1, 1939, but its operation has been suspended by an emergency bill passed by Parliament Oct. 10, 1939. This bill was reluctantly agreed to as necessary by members of all parties in view of the evacuation of school children from the cities because of war conditions. (B. Mc.)

Children's Books. Biography for children and young people ranked high in the 1939 output. Most prominent was *Daniel Boone*, brief, virile text with magnificent illustrations by the author-artist James Daugherty. Another important pictured biography was *Abraham Lincoln*, by Ingri and Edgar Parin d'Aulaire. Others were: *Enchanting Jenny Lind*, by Laura Benet; *Drina: England's Young Victoria*, by Marion W. Flexner; *Washington and the Lafayettes*, by Frank and Cortelle Hutchins; *The Treasure Hunter* (Robert Louis Stevenson), by Isabel Proudfoot; and *Runner of the Mountain Tops* (Louis Agassiz), by Mabel L. Robinson. Among picture books *Little Toot*, a comic story of a bold little tugboat, by

Hardie Gramatky, won loud acclaim. Others were: *Cock-A-Doodle-Do*, by Berta and Elmer Hader; *Madeline*, by Ludwig Bemelmans; *The Happy Flute*, a Hindu St. Francis story, by Sant Ram Mandel with pictures by Dorothy Lathrop; *Lucio and His Nuong*, by Lucy Crockett.

Several classics for little children were given new life. John Bunyan's *Pilgrim's Progress* as retold many years ago by Mary Godolphin was brought out in distinguished format with pictures by Robert Lawson. Andersen's *The Little Mermaid* was published separately with charming illustrations by Dorothy Lathrop. A third attractive new edition was *Twenty Jataka Tales* retold by Noor Inayat and illustrated by H. Willebeek le Mair.

Fiction included among many others *Skippack School*, by Marguerite d'Angeli; *Peter Hale*, by Julia Davis; *Cinders*, by Katherine Gibson; *Little Grey Gown*, by Mabel Leigh Hunt; *Columbus Sails*, by Walter C. Hodges; *Ocean-Born Mary*, by Lois Lenski; *Boy With a Pack*, by Stephen Meader; *Runaway Prentice*, by Ethel Parton; *The Singing Tree*, by Kate Seredy; and *Bright Morning*, by Charlie May Simon.

Several adult writers entered the field for the first time. Kay Boyle's *Youngest Camel* was well reviewed. Gertrude Stein's *The World is Round* aroused considerable discussion as a new form of writing for children. Somerset Maugham's *Princess September and the Nightingale* was a reprint of a Siamese fairy tale from an earlier volume of travel sketches. Illustrations by Richard C. Jones, brilliant in colour and delicately humorous in design, make it one of the most decorative picture books of the year. *My Roads to Childhood*, by Anne Carroll Moore was important as literary criticism and inspirational reading. This volume includes a revision of her reviews and comments on children's books and reading published earlier in her Roads to Childhood series and her reactions to current books for children and young people.

Books of information were many and covered widely diverse subjects. Increased use of photographic illustrations added greatly to their attractiveness and accuracy. Representative titles were: *Machines and the Men Who Made the World of Industry*, by Gertrude Hartman; *America's Treasures* (underground resources), by W. Maxwell Reed; *Here Comes the Mail*, by Robert Disraeli; *Boys' Book of Insects* and *Boys' Book of Photography*, by Edwin Teale; *Heroes on Your Stamps*, by John Gregory. *Fair Play*, by Munro Leaf, is intended to suggest ideals of good citizenship to little children by means of comical pictures and brief arresting text.

The John Newbery Medal was awarded in June to Elizabeth Enright for her *Thimble Summer*. The Randolph Caldecott Medal was won by Thomas Handforth, artist-author, with his *Mei Li*. (See also LITERARY PRIZES; PUBLISHING.) (E. L. P.)

Children's Bureau, United States: see CHILD LABOUR; CHILD WELFARE; JUVENILE DELINQUENCY.

Child Welfare. The disturbed political situation in Europe in 1939 left its mark on child-welfare work in many parts of the world. The expectation of war and the war itself brought about a diversion to other uses of resources which in normal times would have been devoted to the improvement of the situation of children. Most of the European child-welfare legislation in 1939 was aimed at increasing the population. Various measures to this end were prescribed.

In France, under the decree of July 29, 1939, premiums of not less than 2,000 francs will be paid under specified conditions to the mother on the birth of the first viable and legitimate child in the family. Supervision will be maintained to assure the use of the premium for the child's benefit. Family allowances for dependent children, previously paid to limited categories of work-

¹Ministry of Labour Report for the year 1938. Appendix XV, p. 107. London, May 1939.
²Report of the Departmental Committee on the Hours of Employment of Young Persons in Certain Unregulated Occupations, p. 11, London, March 1937.

ers, were extended to practically all persons working for a living, including employers. Persons not receiving family allowances who have permanent charge of one or more children and who lack the necessary resources are entitled to "family aid" varying from 25 to 50 francs monthly for each child. Loans from 5,000 to 20,000 francs are to be made to young persons who intend to be married and to settle in rural districts. The debt is to be cancelled gradually upon the birth of children. The departments (territorial subdivisions of France) were ordered to take measures for the prevention of infant mortality; regulations in regard to maternity homes, abortions, and the care of children born out of wedlock are also prescribed in the decree.

In Denmark a new law requires the establishment throughout the country of offices where expectant mothers and recently confined mothers may receive medical treatment and economic and legal aid.

In Italy the system of compulsory maternity insurance in existence since 1910, under which employed women with a monthly income below 800 lire were insured in their own right and were receiving a specified sum at the time of childbirth, was replaced in 1939 by compulsory insurance "for the promotion of marriage and an increase in the birth rate." Under the new law, which applies only to Italian citizens who are Aryans, insurance is required of all workers with a monthly income below 1,500 lire and the insured persons are paid at the time of their marriage a premium varying from 400 to 1,000 lire according to sex and occupation, provided they are below a specified age. Premiums varying from 150 to 400 lire, according to the parents' occupation and the order of the child's birth, are also paid at the time of a child's birth.

Teaching of child care was introduced by law in Italy in high schools, normal schools, and various vocational schools, including conservatories of music and art schools. The teachers, who must be physicians, are to be paid by the National Government.

The Advisory Committee on Social Questions of the League of Nations held its annual meeting in Geneva from June 19 to July 1, 1939. Twenty nations, including the United States, were represented. Among the special subjects for discussion were the following studies now being made by the committee: Training of persons engaged in social work; social position of the unmarried mother and her child; principles adopted in the administration and organization of welfare work for children; and the problems involved in family desertion.

A new problem in work for children was presented by the large number of refugees. About 500,000 Spaniards—men, women, and children—fled into France early in 1939 following the surrender of the Spanish Loyalist Government. Some of the refugees later went to various Latin-American countries; some returned to Spain; but about 250,000 Spaniards were still in France in July 1939. The responsibility for their care was placed by the Government on the Ministry of the Interior and the departments. The funds granted by the French Government were insufficient and were being supplemented by private gifts of money, clothing, and other necessities. Most of the refugees stayed in camps maintained either by the Government or by private national and international organizations. Some of the children were absorbed in French families.

There were also large numbers of refugee children from Germany and the territories annexed by Germany. These children have been admitted to other European countries, particularly England, France, Holland, and Switzerland. In some of these countries admission is temporary, pending re-emigration. Large numbers of these children have been cared for by private agencies in special institutions or camps with a varying amount of Government supervision. Many children have been taken into private

homes, particularly in England and France. The work for refugee children has been greatly hampered by insufficient funds.

The situation of children in Europe was affected also by the outbreak of war in Europe in Sept. 1939. The shortage of labour due to the military service of large numbers of men and the resulting demand for child workers brought about a suspension of the child-protection laws in some countries. In Germany the National Defence Council issued an order on Sept. 1, 1939, permitting the suspension of labour laws including those relating to the minimum age of admission to employment, hours of work, and night work. In France a decree, also of Sept. 1, 1939, permits the employment of children 14 years of age for 10 hours a day or 60 hours a week, instead of 40 hours as previously; these hours may be prolonged upon permission from a labour inspector. In Belgium the suspension of specified provisions of the child-labour law was permitted by decree of Aug. 26, 1939, in case of re-enforcement or mobilization of the army. In Great Britain the school-leaving age was to have been raised from 14 to 15 years on Sept. 1, 1939, in accordance with a law passed in 1936. Because of war conditions the coming into effect of these provisions was postponed indefinitely.

Among the important developments in Latin America in 1939 were the enactment of a general labour law in Bolivia, prescribing a minimum age of 14 years for employment; prohibiting night work and dangerous, unhealthful, or strenuous work for children under 18; and prescribing a 40-hour week for children under 18. In Colombia regulations were issued defining the functions of the Bureau of Maternal and Child Welfare to be created under the National Department of Labour, Health, and Social Welfare. In Venezuela a children's code was promulgated and the National Child Welfare Council, the social agency in charge of child-welfare work established in 1936, was reorganized for the purpose of making its work more effective. The Eighth Pan American Child Congress, which was to have been held in Costa Rica in October, was indefinitely postponed because of the war in Europe.

In Argentina the National Committee on Aid to School Children completed the first year of its functioning; 670,000 articles of clothing were distributed and school feedings were introduced in 594 localities. A daily average of 74,600 children thus received aid in food and clothing.

In the United States, the Federal-State programs for maternal and child-health services, crippled children's services, and child-welfare services administered by the Children's Bureau, U.S. Department of Labor, under the Social Security Act were expanded in 1939. Amendments to the Social Security Act increased the amounts authorized for annual Federal grants-in-aid to the States for all three programs and made Puerto Rico eligible to receive this aid beginning Jan. 1, 1940. For maternal and child-health services, the amount authorized for annual grants to the States was increased from \$3,800,000 to \$5,820,000. For the fiscal year ending June 30, 1940, the amount appropriated was \$4,800,000, part of which will be used for extending, on an experimental basis, programs for medical care for mothers and children. During the year, State and local health agencies, with this Federal aid, extended and improved their maternal and child-health programs, especially in rural areas. For crippled children's services, the amount authorized for annual grants to the States was increased from \$2,850,000 to \$3,870,000. The additional crippled children's funds are to be allotted to the States on the basis of need and do not have to be matched by the States. Approximately half the increase authorized was included in the amount appropriated for the year ending June 30, 1940. Part of the additional funds will be used by the State crippled children's agencies for the care of children suffering from rheumatic heart disease—children who, for the most part, have not been reached by the

program heretofore. For child-welfare services, the amount authorized for annual grants to the States was increased from \$1,500,000 to \$1,510,000 to cover, in part, the grant for Puerto Rico. Under the administration of State welfare agencies a total of 459 child-welfare workers were employed during the year with Federal, State, and local funds in covering 478 rural counties and local areas with intensive case-work services for children and 690 local areas with more scattered service.

Other amendments to the Social Security Act increased the Federal contribution toward aid to needy dependent children, administered by the Social Security Board under the Social Security Act, and provided survivors' benefits for children of deceased persons covered under the old-age insurance provisions of the act. (See SOCIAL SECURITY.)

The Children's Bureau of the United States Department of Labor continued its activities in research, in assembling current child-welfare statistics, and in the dissemination of technical and popular information relating to the health and welfare of children. Advisory service given to State health, welfare, and labour agencies, is an important part of the administration of Federal grants to the States for maternal and child-welfare services under the Social Security Act and of the administration of the child-labour provisions of the Fair Labor Standards Act.

The widespread attention being given to better care for mothers and babies was reflected in improved mortality rates. The maternal mortality rate for 1938 was 44 deaths of mothers per 10,000 live births, showing a 10% decrease from the rate of the preceding year (49). The infant mortality rate was 51 deaths of infants per 1,000 live births as compared with 54 in 1937. The 1938 birth rate for the United States was 17.6 per 1,000 population, the highest rate recorded since 1931.

The national health program including proposals for an expanding Federal-State program for medical care for mothers and children was submitted to Congress by the President in Jan. 1939. A bill based on the proposed health program was introduced in the Senate, committee hearings were held, and the bill was held over for further consideration during the next regular session of Congress beginning in Jan. 1940. During 1939 several of the States in the United States improved their laws relating to child adoption, to children born out of wedlock, to administrative organization of services for children, and to the supervision of children's institutions and child-placing agencies.

Realization is growing in the United States that, despite advances made, many children cannot be given adequate food and care because of family poverty and many community services for children are available in only a limited number of communities.

On April 26, 1939, the first session of the fourth national conference on child welfare called under Presidential auspices was held in Washington, D.C. The earlier conferences were held in 1909, 1919, and 1930. The fourth conference, the White House Conference on Children in a Democracy, held its second session Jan. 18-20, 1940. It considered a report summarizing child-welfare gains made since 1930, outlining objectives to be sought for children in a democracy, and proposing advances to be made during the next 10 years. (See also CHILD LABOUR; INFANT MORTALITY; SOCIAL SECURITY.) (K. F. L.)

Chile, a republic on the west coast of South America; language, Spanish; capital, Santiago; president, Pedro Aguirre Cerda; area, 289,776 square miles. The country itself is 2,800 mi. in length (from the tropical north to the sub-arctic south) and is nowhere more than 200 mi. in breadth. The population is officially estimated at 4,634,839 (Dec. 31, 1938). Chile has more North European elements in its population than any other Hispanic-American country, with German-Chileans preponderant in some

sections. The Indian population is estimated at 100,000. The chief cities (Jan. 1, 1939 est.) are: Santiago, 859,830; Valparaíso, the principal port, 263,228; Concepción, 77,589; Antofagasta, 53,591; Viña del Mar, resort and suburb to Valparaíso, 49,488; Iquique, 46,458; Talca, 45,020; Chillán, 39,511; Temuco, 35,748; Valdivia, 34,296; Talcahuano, 27,594; and Punta Arenas, southernmost city in the world, 24,307.

History.—The year 1939 was marked initially by the attempts at reform undertaken by the new Popular Front administration of President Aguirre Cerda (inaugurated on Dec. 24, 1938) and bitter conservative resistance. On January 12 the Government announced a vast nationwide public works program to cost 500,000,000 pesos (approximately \$20,000,000) annually, including housing, social security, increase of production, and improvement of education. Political considerations were temporarily shelved, however, when on the evening of January 24, an earthquake regarded as the most devastating ever recorded in America, shook the country from Iquique to Puerto Montt. The region to the south of Santiago, especially an area of nearly 50,000 sq. mi. around Chillán, and Concepción, with around 1,600,000 inhabitants, was the hardest hit. The death toll alone was estimated by competent observers to be in the neighbourhood of 50,000, with the most conservative figures 30,000. At least an equal number were injured. The city of Chillán was practically razed, and a majority of the buildings in Concepción, Talcahuano, Cauquenes, and other important cities destroyed, with a property loss of hundreds of millions of dollars. Relief was rushed from all parts of America. United States Army bombers brought medical supplies, while the British cruisers "Ajax" and "Exeter," then at Valparaíso, converted themselves into transports to carry supplies, as all rail communication was disrupted. The Government conscripted all able-bodied men between 18 and 45 in the stricken area to clear the debris. Over 300,000 persons were inoculated against typhoid to prevent the spread of disease, and in March 700,000 persons were reported still homeless. President Aguirre, after a personal inspection of the stricken area, asked congressional authorization for creation of a 2,500,000,000 peso (about \$80,000,000) fund for the joint purpose of relief and rehabilitation and for general reconstruction of the country economically. This sum, one and one-half times the annual budget, was to be raised by foreign loans and increased taxes. After protracted debate and bitter conservative opposition, Congress approved the measure (April 29).

Throughout the year the Aguirre Cerda administration was faced with opposition to its program from some of the component parties of the Popular Front as well as from the conservative elements. On January 13 retail bakers in Santiago organized a public demonstration against Government action in cutting the price of bread. That this and other early measures met approval was manifested, however, in the support given in by-elections in the same month. In April, Army officers were forbidden to support or join any political group. Meanwhile, in March, the Popular Socialist Vanguard (the renovated "Nacista" party of 1938) and a new Fusion party under former dictator-president General Carlos Ibáñez announced support of the Government. During May action of the minister of the interior in temporarily barring a Conservative newspaper from the mails attracted wide attention and brought about his suspension from office. Exposure of an alleged revolutionary plot to overthrow the Government through a boycott system late in the same month, was followed in August by an attempted coup d'état led by General Ariosto Herrera and Carlos Ibáñez, who had been regarded as a supporter of the Government. The attempt failed. Political feeling continued to run high throughout the year, and, in December, when former President Alessandri (a political opponent of Aguirre Cerda) was returning to the country after an absence of several months, he was threat-

ened by a mob in Antofagasta. Late in December, dissension within the ranks of the Popular Front over fiscal policies brought about the resignation of the Finance Minister Roberto Wacholtz.

Actual concrete achievement of the Aguirre Cerda administration during 1939 was slight, for the economic dislocation caused by the January earthquake disaster and, later, by war and threat of war in Europe, coupled with internal political opposition, materially slowed down progress. The greatest specific achievements were in the realm of improved housing, where 393 new houses were completed, 2,501 were under construction at the close of the year, and construction of 1,383 more was planned for the immediate future. Cost of the housing program was 25,000,000 pesos.

Another feature of the year was the inauguration of a "back to the land" movement. Plans were made for large scale colonization in agricultural regions, particularly the sparsely settled far south, with the settlement of 40,000 families the goal. Several small groups of European political refugees were accepted during 1939, and, late in December, approximately 1,000 mid-European Jewish and other refugees who arrived on the Italian motorship "Augustus" were tentatively accepted despite irregularity of papers, provided they settled in the southern agricultural region.

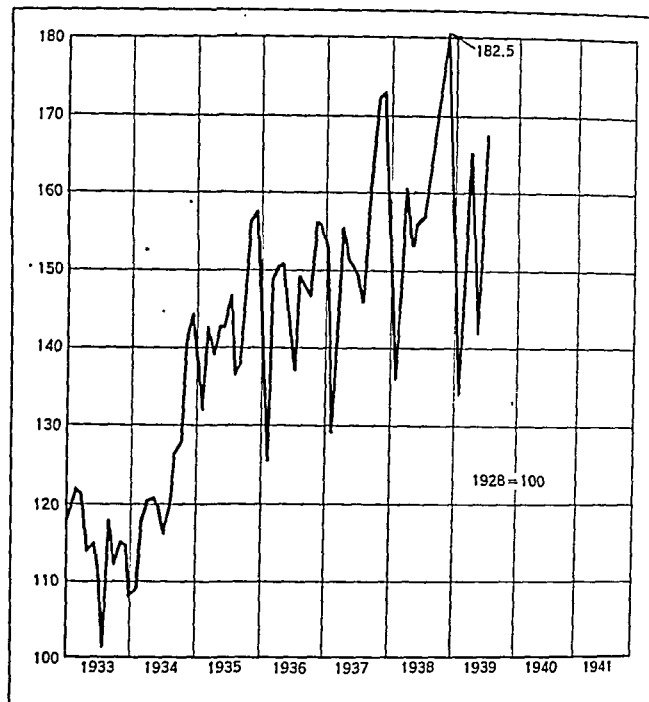
Chilean foreign relations in 1939 were concerned, early in the year, with a dispute with the Franco Government in Spain over the right of asylum in the Chilean legation in Madrid, a right which was tacitly conceded in October. Chile promptly declared her neutrality in the European War and participated in the Panama Conference in September. Nevertheless, she failed to join with other nations of the Americas in unqualified denunciation of Russian aggression against Finland. Some excitement was caused in December by the British capture of the German steamer "Dusseldorf" 12 mi. off the Chilean coast, but on the whole Chilean official and public opinion was pronouncedly anti-Hitler. Late in the year negotiations with the United States for a reciprocal trade agreement were reported to be on the point of consummation. Arbitration of the Beagle Channel islands dispute with Argentina made no progress during 1939.

Education.—Primary education is free, non-sectarian, and compulsory. In 1938 there were 3,504 public primary schools (enrolment, 460,715); 820 private primary schools (enrolment, 97,177); 85 secondary, including the military and naval school (enrolment, 28,177), and 119 special schools (1937 enrolment, 25,296). There are four universities, the National university at Santiago (4,504 students), two parochial, one private (Santa Maria Technical university at Valparaíso), with a total enrolment of nearly 7,000 in 1938. The summer school of the National university, held at Santiago each January, has attracted wide attention and is a mecca for students from all parts of America.

Army and Navy.—Chile has an Army of approximately 30,000 men, and a reserve of around 175,000. A military mission from the United States was arranged in July 1939. The Navy was formerly the most up-to-date in South America, but has declined.

Finances.—The monetary unit is the peso (controlled value: 5.17¢ U.S.; uncontrolled, approximately 3½¢ U.S.). The gold peso ("peso de 6d."), valued at 6d. gold, or 20¢ U.S., is used in foreign trade transactions. The public debt was \$382,151,000 U.S. on Dec. 31, 1938. The budget for 1939 called for expenditures of 1,666,800,000 pesos.

Trade and Communication.—Chile has direct steamship service to Peru, Ecuador, and Panama, and, by way of the Panama canal, to the United States and to Europe. Service to the east coast of South America is maintained through the Strait of Magellan. Regular frequent air transport service northward to Panama and New York, and eastward to Buenos Aires connects the country with all parts of America. Air transport to Europe by German (in peace time) and French lines is effected in four days' time. There



CHILE: Industrial production, adjusted for seasonal variation (*The Annalist*)

are three railway routes to Argentina, available in combination with other connections. Freight service on the Transandine line by way of Uspallata pass has been suspended since its interruption by landslides in Jan. 1934. Railways connect the northern ports of Arica and Antofagasta with Peru and Bolivia.

Internal communication is by railway, coastwise shipping, air, and highway. The Government-owned railway system extends to Puerto Montt in the south. Total railway mileage is 8,352 km. (Aug. 1939). In 1938 orders for new railway equipment were placed in Germany and paid for, but delivery had not been effected at the outbreak of war. In Dec. 1939 arrangements were reportedly made for special permission to bring this equipment through the Franco-British blockade of Germany. Meanwhile, other needed equipment had been ordered in the United States. Communication with the far south is by boat and aeroplane. Internal air transport service is well developed under Government ownership, with routes totalling nearly 5,000 km. in length. A highway system of over 23,000 mi. in length, including 9,500 mi. of improved roads, is being rapidly developed and extended under a comprehensive program adopted in 1936. The Chilean merchant marine is one of the largest in Hispanic America. Service under the Chilean flag is regularly maintained to Buenos Aires, to Guayaquil, and to New York.

Chilean foreign trade in 1938 declined 13.7% from that of 1937, but was 25% greater than in 1936. Exports (682,200,000 gold pesos) were 26.9% less, imports (502,000,000 gold pesos) were 16% greater. Imports came principally from the United States (26.7%), Germany (25.0%), Great Britain (10.6%), Peru (5.8%), Denmark (4.4%), Argentina (4.3%). Exports went chiefly to Great Britain (21.8%), United States (15.7%), Germany (10.0%), Belgium (7.8%), France (4.4%), Italy (4.0%), Sweden (3.1%). Copper and nitrates together account for 80% of all exports. A 28% decline in the price of copper was largely responsible for the export decline in 1938. The increased import value was due largely to heavy aeroplane and merchant ship purchases. The bulk of imports is in manufactured goods, especially machinery and textiles. In the first 11 months of 1939, imports were 372,190,494 gold pesos, a heavy decline, exports 608,507,407 gold pesos. Imports were from the United States (30%), Germany (24%), Great Britain (8.3%), Peru (7.4%), Argentina

(4.4%), Italy (4%), Japan (3.4%), France (2.4%). In November imports from Germany were 11.5%, from the United States, 38%. Exports (11 mos.) were taken by the United States (28.3%), Great Britain (13.4%), Germany (9.2%), Sweden (5.0%), Bolivia (4.96%), France (4.8%), Italy (3.5%).

Agriculture and Mining.—Mineral production is chiefly of copper and nitrates, with totals dependent upon foreign demand and consequently shifting violently from year to year. Copper production in 1938 (308,928,979kg.) was 25% less than the all time record figure attained in 1937. The 1937 total represented 18.8% of all world consumption, highest proportion ever attained by Chile with the single exception of 1934, when it was 18.85%. Nitrates are second in importance, but production and export bear little relation to each other. Other mineral production in 1938 included gold, 9,144kg.; iron, 1,607,000 tons; coal, 2,061,409 tons; silver, 43,984kg. The average monthly employment in the mining industry during 1938 was 65,365 persons, a 3,442 decline from 1937. Nitrate workers totalled 20,147; copper miners, 19,394; coal miners, 13,822. Although minerals are the chief exports, agriculture is the principal industry, with its products largely for domestic consumption. For the season 1939-40, 1,060,908 hectares were sown in cereals, of which wheat was the most important. Fruits are likewise grown extensively, as are grapes. Chilean wine is important. The pastoral industry has made notable progress in recent years, and centres in the far south. There are an estimated 2,634,499 cattle, 5,749,069 sheep, 810,206 goats, 571,495 swine, 527,927 horses in the country. Wool (9,746 metric tons in 1938) and fresh meats (10,465 tons) were exported in 1938, the greater part from the port of Punta Arenas.

Manufacturing.—Manufacturing is insufficient for domestic demands, but is rapidly increasing. Public utility services, food-stuffs, paper manufacturing, and metal work are the most important from the point of view of employment.

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(L. W. BE.)

China, a republic in East Asia, bounded on the north-east by Manchoukuo, on the north and west by Outer Mongolia, Siberia, and Tibet, on the south by India, Burma and French Indo-China, on the east by the Pacific ocean. Capital, Nanking (temporarily removed to Chungking); president, Lin Sen. Excluding those areas over which no effective Chinese sovereignty has been exercised for many years (Manchoukuo, Outer Mongolia, Tibet) China has an area of 2,903,475 sq.mi. and a population of 422,707,868, according to the estimate of the Ministry of the Interior in 1936. No comprehensive census has ever been taken. Population of larger cities: Nanking (estimated, 1937), 1,000,000; Shanghai (foreign and Chinese administrative areas reckoned together, census of 1935), 3,490,762; Peking, 1,487,289; Canton, 861,024; Hankow, 777,993; Tsingtao, 440,135. There were about 185,000 foreigners in China, including 74,000 Japanese, 64,500 Russians, 13,344 British, 8,637 Americans, and 3,444 Germans. The number of Japanese has now substantially increased especially in the cities and towns of North China.

History.—(For the Chinese-Japanese War, see that heading.) The Kuomintang is the sole legal political party in China and the National Government derives its authority from the Kuomintang. There are no general elections; and the nearest approach to a representative body in China is the annual plenary session of the Kuomintang central executive committee and central supervisory committee. The Government is composed of five yuans or departments, the functions of which are indicated by their titles: the executive, legislative, judicial, examination, and control yuans. The Executive Yuan exercises general supervision over the ministries and commissions and its president is really the acting head

of the Government. The president of the National Government possesses only titular powers. The Legislative and Judicial Yuans are concerned respectively with the drafting of laws and the administration of justice. The Examination Yuan is in charge of Government personnel matters and the Control Yuan exercises functions of general supervision and auditing. There is also a cabinet of ministers. The leading figure in the National Government throughout the last decade has been Marshal Chiang Kai-shek.

Education and Religion.—Estimates of illiteracy in China vary from 60-80%. Substantial progress in the educational field has, however, been registered since the establishment of the republic. There were 11,667,888 pupils in elementary schools in 1935, as against 2,793,633 in 1912 and the number of universities and colleges during the same period increased from four to 82. There has been a special effort to spread adult literacy in the larger cities and in some selected rural districts.

Normal educational activity has been seriously affected by the war and the movement of vast numbers of refugees from one part of the country to another. There has been a transfer of higher educational institutions from such occupied cities as Peking, Nanking, Shanghai, and Tientsin to towns in the remote interior, such as Chengtu, in Szechuen, and Kunming, in Yunnan. China's main religions are Buddhism, Taoism, and Confucianism. There are between 5,000,000 and 10,000,000 Mohammedans, mostly in the north-western and far western provinces of the country. There were 2,818,839 Catholics and 512,873 Protestants in China at the beginning of 1935.

Army.—On the eve of the outbreak of the Sino-Japanese war the Chinese armed forces, organized in 16 route armies and 51 armies, (the route armies are larger military units) consisted of 2,271,330 men, of whom 1,996,920 were under the direct control of the National Government, the remainder constituting provincial forces. There are no reliable reports of the forces engaged or of casualties in the present hostilities. Chiang Kai-shek is believed to have maintained fairly intact a force of 150,000-200,000 picked troops, and soldiers from Kwangsi Province, in the south-west, have given a good account of themselves in the war, probably because Kwangsi had one of the most efficient provincial systems of conscription and military training.

Finances and Banking.—The unit of currency is the yuan, or dollar, which was worth 29.65 American cents at the end of 1937, but had fallen to less than eight cents by Oct. 1939.

The general position of the Chinese currency is not altogether accurately indicated by this severe decline. The chief effect of the fall of the Chinese dollar has been felt in Shanghai, where a system of free exchange prevails. Official support for the Chinese dollar was withdrawn in the summer of 1939, because it was believed that Japanese interests in Shanghai were benefiting from the ability to buy foreign exchange with Chinese dollars and because the Shanghai money market was threatened with an influx of Chinese currency from the North, collected by the Japanese. In the interior of the country the purchasing power of the Chinese dollar, except in relation to foreign imports, has been very much less affected than the present low exchange value of the dollar would indicate. The budget for 1937-38 was supposed to be balanced at 1,000,649,496 dollars; but the outbreak of the war unquestionably affected both income and appropriations. No subsequent budget has been published. According to the budget of 1937-38, the chief items of revenue were supposed to be customs receipts (36.9%); the salt tax (22.85%) and the consolidated tax, a levy on trade and industry, (17.55%). All these sources of revenue have been gravely impaired by the Japanese occupation of China's main ports and industrial centres, and of some of the chief salt producing areas. The war has been financed largely by loans and by a policy of drastic retrenchment in Government

expenses, while munitions and supplies from abroad have been paid for largely with exports of silver and by drawing on reserves in foreign banks. The three largest and most important banks in China are the Central Bank of China, the Bank of China, and the Bank of Communications. There are also 14 Japanese and 19 other foreign banks which carry on business in China.

Trade and Communications.—China's imports amounted to 941,545,000 Chinese dollars and exports to 705,741,000 dollars in 1936. Exports were stimulated by the abandonment of the silver basis of the currency in 1935 and the depreciation of the Chinese dollar. China's exports during 1937 amounted to 838,255,705 Chinese dollars, imports being 953,386,007 dollars. The year 1938 did not reveal any very great change, with exports at 762,600,000 dollars and imports at 886,200,000 dollars. But of course the real quantity of trade diminished because of the lower value of the Chinese dollar. Reckoned on the more stable basis of pounds sterling (with the pound then worth 4.68 American dollars) China's imports during the first six months of 1939 were £43,545,095, as against £23,403,602 in the first half of 1938. Exports, on the other hand, revealed a decline, from £16,464,557 in the first half of 1938 to £13,394,596 in the same period of 1939.

China had between 6,000 and 7,000 mi. of railways at the end of 1936 and a five-year plan for the construction of 5,300 additional miles after 1936. Highway construction, which had increased substantially during recent years, reached the figure of 56,000 mi. in 1935. According to a report of the ministry of communications in 1931, China had 2,986 registered ships, with a tonnage of 431,892. China has no trans-oceanic shipping lines and much of the coastal shipping is in the hands of British and Japanese firms. A total of 87,755 ocean vessels entered and cleared at Chinese ports in 1936. British ships represented 16,000,000 tons; Japanese 9,500,000 and Chinese 7,300,000. The Government telephone system in 1935 served 21 cities and 62 others were served by private and provincial systems. About 250,000 telephones were in use. China has 53,000 miles of telegraph lines and several high-power radio installations.

The effect of the war has been to wipe out Chinese coastal and river shipping. Japanese shipping enjoys preferential position, although British established lines are still maintaining services along the coast of China and have extended these to Indo-China, now an important country of transit trade with the interior of China.

HATE SHOWED ON THE FACES of this Chinese mob rioting for food in 1939 in the International Settlement of Shanghai



The war with Japan had a varied effect on China's economic development. It brought great misery to a large part of the population as a result of acts of devastation carried out by both sides. By the end of 1938, much the greatest part of China's railway network was in the possession of the Japanese Army. Japan had also taken over the communication systems in occupied territory. On the other hand railway and road construction in the unoccupied south-west was stimulated. (For some of these new routes see CHINESE-JAPANESE WAR.)

The chief cities of China are linked up by air routes, which often serve as a substitute for non-existent rail connections. Commercial aviation is in the hands of the Sino-American China National Aviation Corporation and the Sino-German Eurasia Aviation Corporation.

Agriculture, Manufactures, and Mining.—China is an overwhelmingly agricultural country and is predominantly a land of small-scale farming. As many as 36% of its farms are less than 1.5 ac. in size, while 62% are less than 4.3 ac. Rice is the main crop and the main food in the southern and central part of the country, while wheat, millet, kaoliang, and other grain crops are raised in the North. Animal husbandry is little practised, as there is little spare land for pasturing. China has fallen behind in the production of its traditional tea and silk because of lack of standardization and grading; efforts have been made recently to improve quality and increase output of tea, silk and cotton.

Japan has extensive plans for the reconstruction of industry in those parts of China which have passed under its military control. Two semi-governmental corporations, the North China Development Company, capitalized at 350,000,000 yen, and the Central China Development Company, capitalized at 100,000,000 yen, have been established for the exploitation of these two parts of China. No large enterprises have yet been undertaken, partly because of lack of capital, partly because of unsettled conditions off the railway lines. Japan hopes in time to obtain iron ore from the Lungyen fields (north-west of Peking) and the Tayeh deposits (near Hankow), cotton from several provinces of North China, and coal from Shansi.

A certain amount of industrial salt is already being obtained in the neighbourhood of Tientsin. The Japanese cotton mills which were destroyed by the Chinese before they abandoned Tsingtao are being slowly rebuilt.

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(W. H. CH.)

Chinese-Japanese War. The Chinese-Japanese War which began when Japanese troops clashed with a Chinese garrison at the Marco Polo bridge, near Peking, continued throughout 1939. However, a substantial change in the character of the war became evident after the Japanese had occupied Canton on Oct. 21, 1938, and Hankow a few days later, on October 27.

This left the Japanese in military control of what were formerly China's seven largest cities¹, Peking, Tientsin, Shanghai, Tsingtao, Nanking, Hankow and Canton. They also held 80% or 90% of China's network of railways. It was officially claimed in Tokyo that by the end of 1938 the Japanese controlled areas amounting to 1,505,700 sq.km., with a population of 170,000,000, while the war fronts were 3,400km. in length. As against this, it was a matter of common knowledge that the Japanese hold on regions off the railway lines was extremely loose and imperfect and the two local Chinese Governments which had been set up under Japanese auspices in Peking and Nanking were definitely lacking in independent prestige and authority.

The capture of Canton and Hankow left the Japanese with few definite objectives to strike at, except at the price of difficult expeditions into a mountainous interior without railways and with only a few good roads. As a result of this change in the situation, there were no repetitions, during 1939, of the large campaigns which, in 1937, had led to the occupation of Shanghai and Nanking, and, in 1938, to the conquest first of Hsuechow-fu, later of Canton and Hankow. Japanese military operations during 1939 fell into three main categories: limited drives for local objectives, air raids, designed to destroy military supplies and to demoralize the civilian population, and naval landing expeditions. The amount of new territory which was even nominally added to the Japanese sphere of conquest during 1939 was very small.

Japanese Military Operations.—The first major Japanese military move of 1939 was the landing on Hainan island on February 10. This is a large and potentially rich territory, about the size of Formosa. It consists of a coastal fringe which has been settled by the Chinese, and of a little-known, wild interior, inhabited by primitive aborigines.

The Japanese Navy had long coveted Hainan as a most promising base of operations in the South Pacific. It lies squarely athwart the British line of communications between Hongkong and Singapore and is within easy bombing distance of Haiphong and Hanoi, the chief northern port and the capital of French Indo-China. Under normal conditions British and French objections might have prevented the occupation of Hainan. But both Great Britain and France were gravely preoccupied with the crisis which was looming up in the Mediterranean area in connection with the concluding phase of the Spanish Civil War. So the Japanese landing, which encountered only weak Chinese resistance, passed off unchallenged. The Japanese Navy had still earlier taken over some small islands off the southwestern coast of China. On March 31 it made a further thrust to the south, seizing the Spratly islands, which are between French Indo-China and British North Borneo and had hitherto been claimed by France. The Spratly group is of negligible territorial and economic significance, including only 247 acres; but represents a useful advanced submarine base for naval operations in the South Pacific.

The first land campaign of any consequence led to the capture, on March 27, of Nanchang, the capital of Kiangsi Province. This,

¹There have been important alterations in the population of Chinese cities as a result of the war. Nanking, the former Nationalist capital, has shrunk from about 1,000,000 inhabitants to a little over 300,000 and Hankow and Canton have also greatly diminished. On the other hand such cities of the interior as Chungking, Kunming, and Chengtu have greatly increased in size.

incidentally, was the only important inland town which the Japanese added to their possessions during the year. The Chinese continued to hold a considerable stretch of the Canton-Hankow railway, from Changsha, the capital of Hunan, to a point not very far north of Canton. The Japanese launched a drive against Changsha, which had been precipitately burned down by the Chinese themselves not long after the capture of Hankow, in the autumn of 1939, but this drive fell short of its objective.

The Japanese objective of isolating China from sea-borne supplies was pushed ahead by the occupation of the minor ports of Haichow, on March 4, and of Wenchow later in the year. Swatow, a fairly large port in South China, was occupied on June 21. China was thus made more dependent on roundabout and expensive routes of overland communication, of which three were of primary importance. These were as follows:

(1) Indo-China. A narrow-gauge mountain railway leads up from Hanoi, in Indo-China, to Kunming, the capital of Yunnan Province. It has also proved possible to ship supplies into Kwangsi Province by road from Indo-China. Haiphong, the normally rather sleepy port of northern Indo-China, became glutted with foreign supplies, purchased for Chinese account.

(2) The Burma-Yunnan highway. This 700-mi. road, much of it over difficult mountainous country, was opened up for traffic during the latter part of 1938. It had been pressed to completion by the conscripted labour of over 100,000 coolies. Liability to washouts, especially in the rainy season, reduces the effectiveness of this route as a channel of supplies, and a road can never be an adequate substitute for a railroad. However, a truck service of increasing proportions has been inaugurated and the Burma highway possesses one distinct advantage over the routes of supply through Indo-China. Munitions can be imported without let or hindrance, whereas the French authorities in Indo-China, apprehensive of Japanese reprisals, have forbidden the transportation of munitions to China through this colony.

(3) The "Red route" from Urumchi, in Chinese Turkestan via Lanchow to Sian, capital of Shensi Province. The huge distance from the nearest Soviet rail-head to Sian and the rough character of the former caravan trail which constitutes the basis of this route impose limitations on the amount of munitions and other supplies which China can import, largely on a barter basis, from the Soviet Union.

The Japanese made no effort to penetrate into the remote interior of China. They did, however, let loose a number of sporadic, but sometimes very destructive, air raids against the new Chinese military and industrial centres, such as Chungking, the Nationalist capital, 1,000mi. up the Yangtze river from the coast, Kweiyang, capital of Kweichow Province, Kweilin and other towns in Kwangsi Province.

While the Japanese failed to advance appreciably during 1939, the Chinese also experienced no success in recapturing towns which were under Japanese occupation.

The war tended more and more to assume an irregular guerrilla character, which is always difficult to follow and describe with even approximate accuracy. All that is certain is that a good deal of destruction was inflicted on the unfortunate peasant population, both by the guerrillas in their raids and by the Japanese in their reprisals.

The effectiveness of the irregular resistance, assisted by mobile units of the regular Chinese forces varied from province to province, depending on the character of the terrain and the capacity of the leadership.

Mountainous Shansi Province, where there were considerable forces of Chinese Communist troops, veterans of long guerrilla campaigns against the Nationalist Government in the decade before the outbreak of the Chinese-Japanese War, proved ex-



A TWO-DAY RAID of Chungking by Japanese bombers on May 3 and 4, 1939, killed thousands of Chinese

tremely difficult for the Japanese invaders.

On the other hand, there were times when large towns like Tsingtao were held without difficulty by extremely small Japanese garrisons, and foreign observers sometimes expressed surprise at the lack of initiative of the guerrillas in neglecting opportunities to blow up ammunition dumps and destroy supplies in places where there were only small Japanese forces. A fairly regular train service, interrupted now and then, to be sure, by wrecks, was operated by the Japanese over the railways which they occupied.

Quarrels, personal and political, among the guerrilla leaders themselves not infrequently hampered their effectiveness. While the Chinese Communists were supposed to be included in the united national anti-Japanese front, some of the Communist newspapers complained that local Chinese "reactionaries" occasionally attacked the Communist guerrillas. It is difficult to draw a hard-and-fast line between irregular warfare and banditry. This is especially true in China, where banditry has long been an inevitable outgrowth of poverty, maladministration and overpopulation. Not a few guerrillas are more interested in living off the country than in fighting the Japanese.

War Becomes Endurance Contest.—With the period of big campaigns and drives for definite objectives apparently ended, the war between Japan and China tended to become more and more a contest in national endurance. It is both less than a war and more than a war. It is less than a war because of the small scale of the operations. On the Japanese side these are largely restricted to short drives for limited objectives, frequent mop-up campaigns against guerrillas behind the lines and periodic air raids on Chinese cities and routes of communication.

The Chinese reply is largely in the form of partisan warfare and well organized terrorism against those Chinese who consent to

serve in the Japanese-sponsored local administrations. Neither side can reasonably hope to achieve decisive or spectacular victory in any short period of time by such tactics.

At the same time the struggle is more than a war. Its economic, financial and diplomatic aspects tend to overshadow the purely military aspects. When Japan is able to buy Chinese foodstuffs and raw materials for yen or for the new currencies which are sponsored in the occupied regions or to destroy some Chinese reserve of oil, imported for precious foreign currency, this is the equivalent of a military victory. The reverse is the case when the Chinese are able to wreck some Japanese rolling-stock, to tear up Japanese rails, to find new avenues of export for their products.

Both China and Japan are digging in for a protracted test of endurance. A very significant and probably permanent result of the war has been a remarkable shift of Chinese industry, education, and even population to the hitherto undeveloped provinces of the west and south-west, to Szechuen, Shensi, Kweichow, Yunnan. New factories are being built, universities established, roads and, at a much slower pace, railways are being inaugurated. While exposed to air attack, these regions are reasonably safe against overland invasion; and it is Chiang Kai-shek's policy to husband China's national strength and resources there until circumstances make possible a return to the temporarily lost coastal provinces.

As for the Japanese, they give every indication of having come to stay in the occupied areas, especially in North China. Various industrial and trading monopolies have been established and there has been a remarkable influx of Japanese merchants, traders, handicraftsmen, restaurant keepers and others not only into such large cities as Peking and Tientsin, but into the smaller provincial towns along the railway lines.

A war of banknotes has been going on side by side with the war of bullets, bombs and shells. At first sight Japan may appear to have come off better in this currency war. The Japanese yen, worth between 28 and 29 cents when the war broke out was quoted at a value of 23.65 cents late in Oct. 1939. The Chinese dollar, formerly worth almost 30 American cents, was (Dec. 31, 1939) quoted at less than eight cents.

It must be remembered, however, that the yen is rigidly and artificially controlled, like the German mark. The Chinese dollar, on the other hand, has been left to find its own level and, unlike the yen, has been interchangeable for foreign currency. The downward slide of the Chinese dollar on the Shanghai market during the summer of 1939 was deliberately left unchecked because the Japanese, who had acquired large quantities of Chinese notes in North China, hoped to transform these into foreign currency—an operation which would, of course, have been disadvantageous to China. In free markets, such as Shanghai, the Japanese yen has been far below its official rate of foreign exchange and at times has even fallen below the Chinese dollar.

Japan has endeavored to install its own currencies in occupied Chinese territory, with the idea of buying up Chinese foodstuffs and raw materials which may then either be used in Japan or sold for badly needed foreign exchange in other markets. The largest of these new issues is the Federated Reserve Bank notes, put out in North China. Although these notes are supposed to be on a par with the Japanese yen, they have been at a persistent discount in relation to the Nationalist Chinese dollar, a discount which was at one time as high as 40% and later fell to 18%. The circulation of these notes is restricted to cities and districts under direct Japanese control. Guerrillas have made a practice of executing Chinese found in possession of large quantities of this money.

So-called military yen, officially valued as worth two Chinese dollars have been used for the payment of Japanese troops in Central and South China and have achieved limited acceptance as currency in regions where there are considerable numbers of Japanese

troops. The Hua Hsing Bank, of Shanghai, has put out another Japanese-sponsored currency which, rather curiously, is supposed to be equal in value to the Chinese Nationalist dollar, although the Japanese have frequently predicted that the latter is doomed to collapse.

The war has been enormously costly to both countries. China's losses have been the most obvious. Apart from a great amount of outright physical destruction, especially in the Chinese part of Shanghai, a very large amount of Chinese State and private property has been expropriated by the Japanese Army and by Japanese business firms. Millions of refugees have been uprooted and thrown from one end of the country to another. The main centres of trade and industry are in enemy hands; customs revenue, always an important item in the Chinese budget, has almost entirely disappeared; and valuable natural resources such as the iron, coal, and salt of North China have passed into Japanese hands.

The war has been fought off Japanese soil and Japan's losses are not so visible to the eye. But these are also far from light. Unproductive war expenditures have depleted the country's slender gold reserves and cut deeply into its standard of living. Although the yen has been held at an artificial rate, the wholesale price index had risen by 32% and the retail price index by 30% during the two years after the outbreak of the war—a clear symptom of inflation.

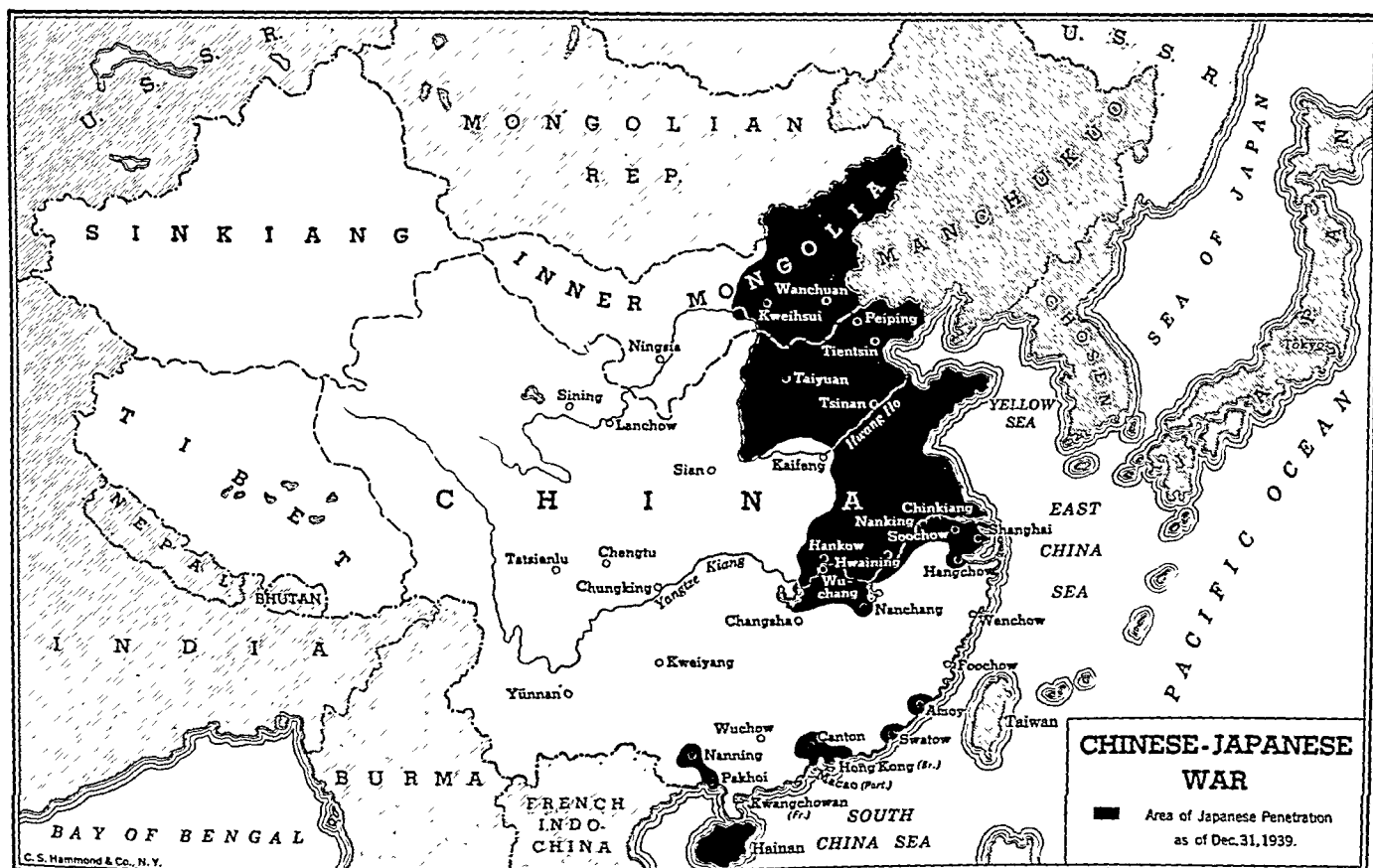
These official indices, incidentally, understate the actual rise in prices, because they are partly based on theoretical controlled prices which do not prevail in the markets.

Higher prices mean a higher cost of living, for which there has been no compensating increase in wages and salaries. At the same time Japan's national income from shipping and foreign trade has been heavily reduced, because of the necessity of employing ships for war purposes, because of difficulty in obtaining raw materials when the country's stocks of gold and foreign exchange are constantly becoming less.

Japanese Hopes for Settlement.—It is a curious and significant fact that Japan, despite its military victories, has more than once taken the initiative in trying to promote a settlement of the conflict with China. Its first offers, put forward through the agency of Dr. Oskar P. Trautmann, German ambassador to China, in Nov. and Dec. 1937, were not considered acceptable by the Chinese Nationalist Government. Japan's next "peace offensive" was launched on Dec. 22, 1938. It was not addressed to any specific regime in China, because in Jan. 1938, the Japanese Government had renounced the idea of dealing with Chiang Kai-shek and the Nationalist Government.

The Japanese premier at that time, Prince Fumimaro Konoye, simply outlined the Japanese conception of satisfactory terms of settlement. Annexations and indemnities were renounced; but Konoye proposed that special facilities for Japanese development of natural resources should be granted, especially in the north, that Japanese troops should be stationed at specified places in China, while China was to associate itself with the anti-Comintern pact and to recognize the independence of Manchoukuo.

Konoye's terms were repudiated by the Nationalist regime at Chungking. During 1939 Japan's soldiers and statesmen tried to find a Chinese, more representative than the heads of the dependent Chinese Governments which have been set up in Peking and Nanking, to head a new administration with which Japan might make peace. The two names most often mentioned in this connection were those of Wu Pei-fu, a formerly powerful warlord in Central China who had been living in retirement in Peking, and of Wang Ching-wei, the sole prominent figure in the Kuomintang who openly seceded from the Nationalist camp and expressed himself in favour of peace on the basis of Prince Konoye's terms. Wu Pei-fu (*q.v.*) could not be coaxed out of retirement and up to late fall Wang Ching-wei, despite several rumours of impending action on his part, had taken no positive steps toward the formation of a government.



The European War.—The outbreak of a new great war in Europe is bound to have the strongest effects on the Chinese-Japanese struggle. These effects might have been more prompt and more spectacular if the European war had broken out a few months earlier. For the "anti-Comintern" policy of close association with Germany and Italy had strong advocates in Japan.

But this policy received a mortal blow when Germany and the Soviet Union signed a non-aggression pact on Aug. 24, 1939. This pact paved the way for the outbreak of war in Europe. But in Asia it made for moderation because it left the Japanese extremists who had taken Germany's anti-Communist professions seriously and envisaged common action with Germany against the Soviet Union crestfallen and disillusioned. The cabinet of Baron Kiichiro Hiranuma, which had been in office at the time of the conclusion of the German-Soviet Pact, resigned and made way for a new cabinet, headed by an elderly general with a reputation for moderation, Nobuyuki Abe. This cabinet issued a statement to the effect that "Japan does not intend to become involved in the European war and will concentrate its efforts on the settlement of the China affair."

The Japanese press started a campaign for the withdrawal of the troops and warships of the Western Powers from Chinese cities and waters, but this, up to late fall, had not been followed by any positive action calculated to aggravate Japan's already strained relations with Great Britain and America.

There were two important differences between the Far East in 1939 and the Far East at the time of the World War (1914-18). At that time Japan was an ally of Great Britain and entered the war on the Allied side. It seized the German possessions in the Orient and helped to keep open British sea lanes of communication. No such co-operation is to be anticipated today. Indeed, in the light of the political developments of the last few years Great Britain and France are probably glad to be able to rely on at least a provisional Japanese neutrality.

The World War (1914-18) was a windfall to Japan, especially to its trading and shipping interests. Market openings for Japanese goods sprang up all over the world because of the war pre-occupations of the leading industrial European Powers. Remaining on the outer fringes of the world conflict and not forced to put forward any great national effort, Japan was in a position to enrich itself, or at least those classes which benefited from the war trade boom and to lay the foundation of its subsequent industrial and commercial expansion.

No such possibility is open to the Island Empire now, because it has already mortgaged its economic resources so heavily in the war with China. The lack of foreign exchange hinders the purchase of the raw materials. Much the greatest part of Japan's merchant marine is engaged either in direct war auxiliary service or in the transportation of goods and materials between Japan, Manchoukuo, and China. The chances of profiting directly from the European war are therefore much more limited than was the case 25 years ago.

Japan took advantage of the World War to press its program of expansion in China; it was no accident that the famous Twenty-one Demands were presented to China in 1915, when no European Powers could give China effective support. The present situation is different, because Japan is already engaged in war for the purpose of imposing its will on China. The actual state of war, of course, makes England and France more helpless in the Far East, although the acute threat of war which existed during the last years had much the same effect. On the other hand, Japan must still reckon with the United States, still quite fresh and uninvolved in Europe.

Results and Prospects.—This Far Eastern war, affecting one-quarter of the human race, has (1940) entered its third year. The

gulf between Japan's claim, advanced under various formulas, for what amounts to a position of hegemony in China and the Chinese Government's demand for respect of China's administrative and territorial integrity and sovereignty seems as wide as ever. Certain results of the war may, however, be assessed, and certain prospects for the future suggested.

The Japanese state that up to the end of April 1939 their losses in killed were 59,998, while the Chinese losses had been 936,345. The Chinese, on the other hand, offering no estimate of their own losses, placed the Japanese figures at 864,500 up to May 15, 1939.

While the Japanese estimate of their own losses is probably an understatement it is almost certainly much closer to the truth than the Chinese figure. There is no way of accurately calculating Chinese losses. Probably the losses among civilians who have perished as a result of famine, floods, exposure, disease and other accompaniments of war are even greater than among the troops. Because of inferior equipment and training the latter have certainly lost much more than the Japanese.

Events have shown that the Japanese cannot conquer all China and that the Chinese cannot drive the Japanese from the ports, large towns and strategic areas which the latter hold. Both countries have suffered severely economically and financially; the standard of living has fallen in both, as a result of war sacrifices.

China has, of course, sustained a good deal of human and material destruction for which there is no parallel in Japan. It would be rash, however, to say that either Japan or China is on the eve of collapse. All that seems certain is that the longer the war goes on the less decisive become the purely military aspects of the struggle.

On the other hand the element of morale, the economic and financial considerations, the possible effects of the European war and of the policies of outside powers tend to bulk larger as factors which will finally decide the issue of the Chinese-Japanese War. (See also ARMIES OF THE WORLD; FOREIGN MISSIONS; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; INTERNATIONAL LAW; LEAGUE OF NATIONS: *China*; NEUTRALITY; UNITED STATES: *Foreign Relations*.)

(W. H. CH.)

Chinese Turkestan: see SIN KIANG.

Chosen (Korea), a part of the Japanese Empire, is a peninsula extending southward from the north-eastern part of the continent of Asia. Its eastern coast faces the Sea of Japan, its western coast the Yellow sea; and it borders Manchoukuo and the maritime province of Siberia on the north. Area 85,206 sq.mi., including 1,018 islands. Population (Dec. 31, 1936) 22,047,836, including 608,959 Japanese and 65,275 Chinese and other foreigners. The capital is Seoul (Keizyo), population (1933) 382,491. Other cities: Fusan, 139,538 (1931); Ph्यों-yang (Heizyo), 144,215; Taikyu, 102,180. Governor-general, General Jiro Minami (since 1936). Chosen (Korea) was annexed to Japan in 1910, after a preliminary period of Japanese protectorate. It is administered by the Government-General, which has eight administrative offices. The governor-general is assisted by a consultative body known as the central council, consisting of a chairman and vice-chairman, five advisors and 65 councillors.

Education and Religion.—Chosen in 1936 had 4,440 schools of all kinds, with 1,087,387 students. There are a number of Christian mission schools in the country. Prevalent forms of religion among the Koreans are Buddhism, Taoism, and Confucianism. There were 441,419 Christians in Chosen in 1934.

Finances and Banking.—The unit of currency is the Japanese yen (worth 23.65 American cents at the end of 1939). The Bank of Chosen is the central banking institution and there are ten

other banks, with deposits totalling 686,191,000 yen. The budget for 1939-40 was 643,217,000 yen.

Trade and Communications.—Chosen's foreign trade is mainly with Japan. Exports in 1937 were valued at 685,542,752 yen and imports at 863,552,502 yen. Of the exports, 518,047,000 yen worth were sent to Japan, and 647,918,000 worth of imports were purchased from Japan.

Exports to foreign countries in 1937 were 113,098 yen and imports from foreign countries were 126,052 yen. There were 3,129mi. of railways and 17,244mi. of roads in 1937. There were 1,134 steamers with a tonnage of 70,184, and 11,730 sailing-boats with a tonnage of 150,473. There are three airports, at Seoul, Phyöng-yang and Urusan and regular air communication is maintained with Japan and Manchoukuo. The total length of telephone and telegraph lines is 9,531km. and 8,758km. respectively.

Agriculture, Manufactures, Minerals.—Chosen is overwhelmingly an agricultural country and over 80% of its population is engaged in farming. Rice is the main crop, production in 1936 reaching the figure of 97,000,000bu. of which a little less than half was exported to Japan. Other agricultural products include wheat, barley, soya beans, apples, cotton, sugar-beets and silk. Gold is the most valuable mineral resource; its output in 1936 was valued at 49,909,000 yen (about \$14,000,000). No figures of gold production have been issued since the summer of 1937.

(W. H. CH.)

Christian Front: see ANTI-SEMITISM; PROPAGANDA.

Christian Science. For the Christian Science movement (which includes The Mother Church, The First Church of Christ, Scientist, in Boston, Massachusetts, and its branches throughout the world), 1939 was another period of steady progress. This was the case, not only in the United States, but also in other countries. Even in Germany, the growth of this movement has not been stopped by the efforts of National Socialism to make itself an exclusive interest, and by official restrictions on the activities of religious bodies.

Mary Baker Eddy founded the original Church of Christ, Scientist, in Boston, in 1879. Now the Christian Science denomination has spread to all countries where English is spoken and to other countries on all of the continents. Authorized Christian Science literature is published, to different extents, in 17 languages, including periodicals in English, French, German, Netherlandic, and Scandinavian languages; also, in Braille and Moon types.

In the United States and Canada, and to some extent in other countries, Christian Scientists have continued to make an increased use of radio as a means of making Christian Science correctly known to the public. This broadcasting has included church services, the Columbia Church of the Air, lectures, devotional programs, and transcriptions by qualified speakers. Likewise, *The Christian Science Monitor* has continued to develop its broadcast, "The Monitor Views the News," which consists of editorial comments on important news of general interest. *The Monitor* has also continued to develop as a newspaper.

The Christian Science denomination (Dec. 1, 1939) includes 2,851 churches and societies, besides many Christian Scientists living where local congregations are not yet organized. There are 2,175 churches and societies in the United States, 317 in Great Britain, 87 in Germany, and 272 in other countries, including those most distant from Boston (Australia, New Zealand, and South Africa). There are 70 Christian Science Organizations at colleges or universities, and 11,232 practitioners engaged exclusively in Christian Science practice.

(C. P. S.)

Christian Unity: see CHURCH REUNION; RELIGION.

Christmas Island: see STRAITS SETTLEMENTS.

Chromite. World production of chromite has more than quadrupled since the low point of 1932, expanding in 1937 by 36% to an estimated total of 1,300,000 metric tons but declining to 1,050,000 tons in 1938. Information on the trend of operations during 1939 is unusually scarce, but such as is available seems to indicate that during the first half of the year production was at an even lower rate than in 1938 in most of the leading countries, with the possible exception of Turkey and Cuba. These observations are confirmed by the rate of importation by consuming countries, which, so far as available, seems to be about 10% below that of 1938. There was a decided upturn in the third quarter in some areas, and unless the fourth quarter shows still greater demand, it would seem unlikely that the world total for 1939 could much exceed 900,000 tons.

World Production of Chromite
(Metric tons)

	1929	1932	1936	1937	1938
Cuba	53,799	500	71,086	94,592	40,200
Greece	24,214	1,555	47,400	52,600	35,000?
India	50,361	18,190	50,276	63,300	39,100
Japan	9,163	12,492	36,309	?	?
New Caledonia	52,594	69,429	47,839	48,022	52,200
Philippines	—	—	11,890	69,856	66,900
South Africa	63,974	19,371	175,700	168,600	183,600
So. Rhodesia	265,909	15,692	183,395	275,617	186,000
Turkey	16,178	55,196	163,880	192,508	208,400
U. S. S. R.	52,889	62,100	220,000	?	?
Yugoslavia	43,022	43,925	54,044	59,932	58,500
Total	635,200	298,500	1,068,000	1,300,000?	1,050,000?

The United States produces only a few hundred tons of chromite, but in 1937 imported 562,800 tons; in 1938 imports dropped to 357,700 tons, and in 1939 to 230,400 tons for the first 10 months. Germany seems to be the only one who was increasing imports during the first half.

(G. A. Ro.)

Chronology: see CALENDAR OF EVENTS, 1939, PAGES 1-18.

Churches, World Council of: see CHURCH REUNION.

Churchill, Winston Leonard Spencer (1874-), British states-

man, was born on November 30, the elder son of Lord Randolph Churchill and Jennie, daughter of Leonard Jerome of New York city. For his biography and his political career during the World War, see *Encyclopædia Britannica*, vol. 5, pp. 686-7.

Particularly after the union of Austria and Germany in March 1938 did Churchill become an outspoken opponent in Parliament of Prime Minister Chamberlain's conciliatory dealings with Germany and Italy. He was singled out by the German press and by Nazi officials for vitriolic attacks, and Hitler in several public speeches has called him "apostle of war" and "warmonger." When Britain took a firmer stand with Germany, Churchill pledged Chamberlain his political co-operation and praised the latter's efforts to form an anti-aggression bloc. In July and Aug. 1939 there was an increasing demand in the London press for his appointment to the cabinet. On September 3, a few hours after Britain's declaration of war, he entered the war cabinet as First Lord of the Admiralty, the same office he had held at the beginning of the World War. His first statement was a denunciation of the torpedoing of the "Athenia" as inhuman; whereupon Germany retorted that Churchill had probably secreted a bomb in the liner to sink it and thus influence American public opinion. Churchill did not bother to refute these charges, later repeated by Goebbels, but confined his public observations to the progress of Britain's

blockade and warfare on submarines. On October 1 he made a bid for Russia's friendship or neutrality, and praised Italy as a "great and friendly nation."

Church Membership. In the last Federal census, taken in 1926, some 212 separate and distinct religious bodies were listed in the United States. Since that time some few new groups have been organized, but there have been many dropped from the roll, and there have also been several mergers of the larger bodies. The roll for 1939 shows a reduction in number to 200 recognized bodies.

Economic and cultural pressure has accounted for some of the disappearances, while at the same time producing certain new "protest" churches or groups seeking an escape from the realities of the depression years. Under this head might be grouped such organizations as Father Divine's Peace Mission and The Church of the Firstborn of the United Sons of the Almighty. Cults with Oriental philosophies or theologies have had a slight increase; humanistic groups have slightly declined.

Progress toward merger is being made at the moment between the Presbyterians and the Protestant Episcopalians, and the United Brethren and Evangelical Churches. All signs point to the joining of these several bodies, though perhaps not in the near future.

The church and membership reports of the religious groups with memberships of 50,000 or over are as follows:

<i>Denominations</i>	<i>Churches</i>	<i>Inclusive Membership</i>
African M. E.	7,115	650,000
African M. E. Zion	4,205	597,785
American Baptist Assoc.	2,662	263,484
American Lutheran Conf.	6,001	1,441,348
Assemblies of God	3,580	197,228
Brethren (Conservative Dunkers)	1,025	164,784
Christian Reformed	290	118,973
Christian Scientist	2,130	202,098
Churches of Christ	6,226	433,714
Church of God	1,351	82,990
Church of God in Christ	1,200	200,470
Colored M. E.	4,258	333,600
Congregational & Christian	6,109	1,030,914
Cumberland Presbyterian	1,096	70,539
Disciples	8,056	1,597,779
Evangelical	1,890	224,457
Evangelical & Reformed	2,915	833,790
Four-Square Gospel	307	257,035
Free Will Baptist	397	79,050
Friends	678	85,257
Latter Day Saints	1,519	690,401
Methodist Episcopal	24,295	4,364,342
Methodist Episcopal South	16,320	2,822,516
Methodist Protestant	2,111	198,780
National Baptist (Col.)	24,000	3,796,645
Nazarene	2,341	140,291
Northern Baptist	7,559	1,471,788
Presbyterian, U. S. A.	8,700	1,903,747
Presbyterian, U. S. (South)	3,493	497,816
Primitive Baptist	2,700	103,325
Protestant Episcopal	7,354	1,947,322
Reformed in America	724	159,343
Reorganized Latter Day Saints	575	101,122
Salvation Army	1,646	249,258
Seventh Day Adventists	2,362	156,205
Southern Baptist	24,844	4,595,602
Synodical Lutheran Conf.	5,153	1,538,148
Unitarian	377	58,951
United Brethren	2,823	471,674
United Lutheran	3,713	1,541,841
United Presbyterian	861	180,065
Universalist	536	51,998
Total Protestant, Etc.	205,577	35,833,475
Armenian Apostolic	52	108,000
Greek Orthodox	260	395,000
Jewish Congregations	4,150	4,681,242
Polish National Catholic	146	189,620
Roman Catholic	18,428	21,329,688
Russian Orthodox	238	526,000
Serbian Orthodox	35	100,000
Syrian Orthodox	69	61,043
Major Bodies as above	228,055	62,527,068
Other Minor Bodies	19,455	1,629,827
Totals Reported	248,410	64,156,895

(Table by courtesy of Rev. S. M. Cavert, Editor, *Year book of American Churches*.)

The overwhelming majority of religious people and church members in the United States, however, have shown a tendency toward fewer and stronger churches. Over 97% of the reported church and synagogue membership of the country is to be found

in 50 bodies having a membership of 50,000 each or more.

The largest single movement toward church union is to be found in the merging of the Methodist Episcopal Church (4,364,342 members), the Methodist Episcopal Church, South (2,822,516 members) and the Methodist Protestant Church (198,780 members) into a new Methodist Church having a membership of 7,385,638. (See also CHURCH REUNION.)

Church of England. Every aspect of the life and work of the Church of England, as indeed of the Anglican Communion as a whole, was affected by the outbreak of the war. The first nine months of 1939 had been a period of quiet, steady consolidation at home and of enterprising advance in new spheres abroad. The preparations which had been going forward to make 1940 a great missionary year had to be cancelled owing to the postponement of the Lambeth Conference of 1940. The church was confronted with new social, moral, and spiritual problems on a huge scale, and special efforts were devoted to the religious education of evacuated children, and to the providing of spiritual ministrations for the innumerable small groups of anti-aircraft and other troops scattered all over the country.

Apart from other war action, such as the postponement of all controversial business in the Church Assembly, other notable events and developments included good progress with the building of the new Church House, Westminster, and of the great new cathedrals of Guildford, Liverpool, and Blackburn while large extensions were added to the cathedrals of Sheffield and Portsmouth.

The £50,000 Church of England Appeal on behalf of refugees, which had been authorized by the Church Assembly at the autumn session of 1938, met with a generous response which resulted in the course of 1939 in a total of over £65,000.

After 38 years as Bishop of London, the Rt. Rev. Dr. A. F. Winnington-Ingram retired. He was succeeded by Dr. G. F. Fisher, Bishop of Chester.

In the wider field of the Anglican Communion as a whole, mention must be made of the publication of *Partners*, the seventh unified statement of the work and needs of the church overseas, in which the new relationship of partnership which has grown up between the Church of England and its daughter provinces and dioceses overseas, was reviewed; of the historic decision of the Assembly of the Church of India to choose East Africa as its first field of foreign missionary work; and of the acceptance by the Convocations of Canterbury and York of agreements reached with the Lutheran Churches of Estonia and Latvia whereby "by economy" Anglican bishops may take part in the consecration of Estonian and Latvian bishops and Estonians and Latvians unable to receive the ministrations of their own clergy, may resort to the clergy of the Church of England.

Important recommendations were made by the theological faculty of the University of Athens to the Archbishop of Athens, and have been referred to the General Assembly of the Church of Greece. These recommendations included acceptance "by economy" of the validity of the Anglican Ordinations and that no Anglican minister should be reordained by the Church of Greece. These recommendations illustrate the new spirit of friendly *rap-prochement* which has increasingly and happily animated the Anglican and Orthodox Churches in their relations with each other. This spirit is itself significant of the great longing for the furtherance of reunion which is evident throughout all the provinces and dioceses; which was very evident at the World Conference of Christian Youth held at Amsterdam from July 24 to August 2 under the presidency of the Archbishop of York; and which is inspiring everywhere an increasing enthusiasm, especially in India and the other missionary churches overseas. (See CHURCH REUNION.)

(Ro. Sto.)

Church Reunion. In the field of Christian Unity, the most important development during 1939 was the decision to call the first meeting of the World Council of Churches in 1941 and to hold it in the United States. (*See RELIGION.*) This decision, made at Zeist in July 1939, now requires reconsideration in view of the outbreak of the European war. At a meeting of the North American Committee (*see below*), it was decided that while it would not be wise to attempt to hold the first meeting of the Council until the war was over, and all the churches could be represented, it was thought equally unwise to contemplate indefinite postponement.

It was therefore voted to approve the holding of the first meeting of the Council in the United States in 1941 or as soon thereafter as would be practicable.

In preparation for the World Council there was formed in Great Britain, a British Council of Churches which brings together under a single leadership the Church of England, the Church of Scotland and the Free Churches. In the United States, the Faith and Order and the Life and Work Movements are co-operating under a joint executive committee. A North American committee brings together for the purposes of consultation, all the churches of Canada and of the United States.

In the United States the movement for organic unity between the three leading Methodist Churches, the Methodist Protestant Church, the Methodist Episcopal Church South and the Methodist Episcopal Church, was finally consummated at the Uniting Conference held at Kansas City on May 10. The year 1939 also witnessed the completion of the union of the Evangelical and Reformed Churches which, in principle, was agreed upon some years ago.

Still more important, because having to do with the relation of churches of different polity, was a resolution adopted by the Protestant Episcopal Church at its convention in 1937, pledging it to seek organic unity with the Northern Presbyterian Church. Since then commissions of both churches have been studying the possibility of some intermediate Concordat which would permit ministers of each to serve congregations of the other on the approval of the local authority, Bishop or Presbytery as the case may be. A tentative draft, following lines originally suggested in 1936, was provisionally approved for discussion by a joint committee of both churches.

The proposals were warmly received by many in both churches but have been opposed by a small minority of the Presbyterian Church as well as by groups of Anglo-Catholics in the Episcopal Church. Bishop Parsons of San Francisco, the Chairman of the Episcopal Committee and Professor Robbins of the General Theological Seminary, have been among the chief advocates of the Concordat among the Episcopalians, while Bishop Manning of New York has been its most prominent opponent. (*See also CHURCH OF ENGLAND.*) (W. A. Br.)

Ciano, Costanzo (1876-1939), Italian statesman and admiral, was born of a noble family in Leghorn on August 30. He entered the Naval academy in 1891, graduated in 1896, and was promoted through the grades to admiral in 1923. He commanded several warships during the World War and was decorated nine times for distinguished service. His most notable naval exploit was at Buccari on Feb. 10 and 11, 1918, when he ran an entire squadron of torpedo boats through an enemy fleet, invaded the mined harbour and sank six Austrian vessels—a feat which made him a national hero. Count Ciano was first elected to the Chamber of Deputies in 1921 and the next year joined Mussolini in the march on Rome. From 1924 to 1934 he was minister of communications, resigning in the latter year to become president of the Chamber of Deputies. On March 11,

1939, Mussolini appointed him president of the new Chamber of Fasces and Corporations. From the very first stages of Fascist rule in Italy he was an intimate adviser of Il Duce, who was reported in 1930 to have selected the admiral as his political successor. Count Ciano was the father of Galeazzo Ciano, Italian foreign minister, who married Mussolini's eldest daughter, Edda, in 1930. He died at Ponte a Mariano, near Lucca, on June 26.

Cigars and Cigarettes: *see* TOBACCO.

Cinema Industry: *see* MOTION PICTURES.

C.I.O.: *see* CONGRESS OF INDUSTRIAL ORGANIZATIONS; DETROIT.

Citrus Fruits: *see* GRAPEFRUIT; LEMONS AND LIMES; ORANGES.

City and Town Planning: *see* TOWN AND CITY PLANNING.

City Government: *see* MUNICIPAL GOVERNMENT.

"City of Flint": *see* NEUTRALITY; SHIPPING, MERCHANT MARINE.

Civil Liberties. The year 1939 was a transitional one for civil liberties; many old scores were settled while the outlines of future struggles began to take shape. The State of California followed the release of Tom Mooney with the freeing of Warren K. Billings, who had been imprisoned on the same charge. The Supreme Court of the United States, in the case of the Committee for Industrial Organization and the American Civil Liberties Union against Mayor Frank Hague and his fellow officials of Jersey City, infused new life into the old civil rights statutes passed after the Civil War, opened the door of the Federal courts to cases involving deprivations of civil rights by State authorities, and made clear that the guarantees of free speech and free press included a right to use public places for speaking purposes and for the circulation of written matter. In the *Strecker* case, the same court held that previous membership in the Communist Party was not a ground for deportation under existing law. The court left open the more fundamental question of whether the fact that a person is a member of the Communist Party at the time of the deportation proceeding is a ground for deporting him.

In the birth control field, the Supreme Court refused to review the Massachusetts decision closing the clinics there. New cases are being planned, which it is hoped will persuade the Massachusetts courts and the Supreme Court that medically regulated contraception should not be interfered with. Countervailing the Massachusetts defeat was the new ruling of the Post Office department, permitting the free circulation of birth control information and supplies to druggists, as well as doctors; also, the launching by the State of North Carolina of a well-thought-out program of State supervised birth control.

In the field of censorship, the anti-censorship forces won a victory in New York when the Board of Regents reversed the action of the Board of Censors in banning the entirely unoffensive picture *Harvest*. Other films were less fortunate. *The Puritan*, based on Liam O'Flaherty's novel of the same name, was one of those which remained suppressed because of the action of the New York State board. Many others, including *Yes, My Darling Daughter*, were ordered cut by the censors as a prerequisite of their showing.

In the radio field, the code of the National Association of Broadcasters indicated at least an attempt to prevent propaganda being controlled by those who could buy most time.

At the end of 1939, indications are that the emergent civil liberties problem will be the protection of minority groups. The National Association for the Advancement of Colored People has brought a test case to determine whether the State of Maryland may legally pay to Negro teachers salaries lower than those paid to whites. Test cases as to the legality of poll taxes as a con-

dition of voting are in the courts. As yet the public is not aroused at the increasing deprivations of a fair trial by local prosecuting authorities. The Dies Committee continues to investigate so-called subversive activities and has brought to the attention of the public much information of value. Technical defects in the manner of its procedure, however, have created a divided public opinion as to whether its work so far is in aid of civil liberties or destructive of them. Much legislation to prevent libel on religious and racial groups is being framed by those incensed at anonymous propaganda issued by organizations stemming at least in philosophy from alien sources. (See also NEW JERSEY: *History*.) (M. L. E.)

Civil Population, Protection of: see CHEMICAL WARFARE.

Civil Service. Important gains for the merit system were recorded during the year 1939, balanced in part by losses in the States of Arkansas and Michigan. Three States adopted civil service laws for the first time, Minnesota, Rhode Island, Alabama; and New Mexico enacted legislation, not yet effective at the close of the year, for a substantial part of the State service. The number of States with state-wide merit legislation at the close of 1939 was sixteen. Massachusetts reorganized its Civil Service Commission; Vermont and Virginia established study commissions to investigate the desirability of State-wide merit laws.

While these improvements in the public service took place, the State of Arkansas repealed outright its civil service act of 1937, Michigan excluded from its merit system about one third of those who had originally been included, and Tennessee amended its civil service law to give the governor power, during 1939, to exclude specific positions from the classified service. These events indicate that the battle to extend the merit system in the States is likely to be marked by defeats as well as victories, although the tide is steadily moving toward the reduction of patronage.

Perhaps the most important extension of the merit system in the States will grow out of the amendments to the Social Security Act. Upon President Roosevelt's recommendation, this act was amended in 1939 to require the merit system in all State agencies co-operating in the administration of the law, in the following terms: A state plan must provide such methods of administration, including the establishment and maintenance of personnel standards on a merit basis, as the Board may prescribe, except that the Board may exercise no authority with respect to the selection, tenure of office or compensation of any individual employed in accordance with such methods.

This provision is effective Jan. 1, 1940. The Social Security Board, now a part of the Federal Security Agency, has already issued the basic requirements and minimum standards which it will accept. Practice by other agencies administering Federal grants has varied widely; the Bureau of Public Roads and the Children's Bureau illustrate Federal agencies which have refrained from requiring minimum personnel standards, while the U.S. Employment Service has required a formal, competitive examination for admission to State co-operating agencies. It seems probable that in future co-operative administration involving a Federal grant, the requirement of minimum personnel standards within the States will become established practice.

There were extensions of the merit system in county and city government during 1939, but not on a scale different from that of recent years. Among the more important local jurisdictions adopting civil service ordinances we note Atlanta, Georgia; Mobile, Alabama; and Atlantic City, New Jersey. In this connection the spectacular rehabilitation of the Los Angeles City Civil Service Commission represents an important advance.

During 1939 there were no large extensions of the merit system

in the Federal Government. Congress, however, again expressed its concern over the abuse of patronage and politics in administration by passing the Hatch Act, in principle a declaration of first importance. Among other prohibitions of the act we may note that it is made unlawful for any person employed in any administrative position by the United States to use his official authority to interfere with or affect national elections; for any person whatever to solicit political contributions from persons receiving relief or work relief; and no officer or employee of the Federal Government is allowed to take an active part in political management or in political campaigns. Provisions for enforcement are inadequate.

In the administration of the Federal service the year 1939 was one of unusual activity. The newly formed Council of Personnel Administration rapidly developed its work of co-ordination, stimulation, guidance and advice. Franklin D. Roosevelt appointed a distinguished career man, Dr. William H. McReynolds, to act in the dual capacity of Administrative Assistant to the President and Liaison Officer for Personnel. The Council, the Liaison Officer, a reinvigorated Civil Service Commission and about 30 recently established departmental personnel officers now form the solid foundation on which progress in personnel management in the Federal service seems assured.

On Feb. 1, 1939, the President appointed a special Committee of Inquiry whose principal task was to make recommendations concerning the professional, scientific and higher administrative officials of the Federal Government. In view of the special importance of the lawyers as a professional group, the President requested Mr. Justice Stanley Reed of the Supreme Court to act as chairman of the committee, to report early in 1940.

Two significant developments running through Federal, State, and local jurisdictions deserve special notice in summarizing the principal trends of 1939. The first of these is the rapid emergence of nationwide career opportunities in the field of personnel administration. During the year, nationwide examinations were held by the U.S. Civil Service Commission for director and assistant director of personnel at salaries ranging from \$4,600 to \$6,500; by Minnesota, Rhode Island and Wisconsin for director of civil service at salaries of \$6,000; by Seattle, Washington, for secretary and chief examiner at \$4,200 to \$4,620; by Los Angeles for five technical grades ranging from \$2,400 to \$4,620; by Buffalo, New York, and Portland, Oregon, for personnel officers of different grades.

The case of Portland is significant. There were 154 qualified applicants for junior personnel technician; the five States contributing the largest numbers were, in order, New York (37); Oregon (23); California (21); Washington, D.C. (12); and Michigan (9). These figures reveal a nationwide interest and also a national reservoir of competent technicians.

The second principal emphasis of the year was continued expansion of interest in and facilities for in-service training. The program of the George-Deen Act for Federal aid to local public service training was put in motion; the U.S. Department of Agriculture developed a comprehensive and forward-looking plan for the nearly 100,000 men and women in its ranks; the U.S. Civil Service Commission appointed a Director and Co-ordinator of Training to advise with the various Federal agencies; Mayor La Guardia organized in New York city a Council on Public Service Training. These are examples merely of a rapid evolution of training opportunities which are an integral part of the formation of a career service.

The concept of a career service continued to attract wide attention during 1939 and to make substantial gains within the protecting walls of the merit system. One aspect which was especially noteworthy was the number of career men in municipal and State administration who were attracted to the Federal Government.

The flow of talent is almost entirely upward, thus creating the possibility of a serious drain upon the administrative resources of the State and local governments.

Another aspect in 1939 was the rapidly increasing number of public employee retirement systems, stimulated in part by the general provision of old-age security under the Social Security Act. Increased emphasis is being placed upon State-wide retirement systems which also cover, either optionally or otherwise, the employees of the local subdivisions. This is probably the solution of the problem of public employee retirement systems for small communities. (L. D. W.)

Civil War in Spain: *see* SPAIN, CIVIL WAR IN.

Clairvoyance: *see* PSYCHICAL RESEARCH.

Clay. The clays of chief commercial importance include kaolin or china clay, ball clay, fireclay, bentonite, fuller's earth, and a number of others of minor importance; these are consumed in the production of a wide variety of products, such as pottery and stoneware, tile; terra cotta, refractories (firebrick, crucibles, glass pots, etc.), building brick and tile, and a host of others; in addition, clays are utilized in the manufacture of paper, rubber, linoleum, paints, cement, chemicals, plaster, and asbestos products, as well as in the filtering and decolorizing of oils, and in a number of other ways. Clay production in the United States totalled 4,464,000 short tons in 1937, and imports exceeded exports by 36,500 tons, but the 1938 output dropped to 2,902,000 tons, a decrease of 35%. Refractories of various kinds usually take 45-60% of the supply, ceramics 12-20%, paper 10-13%, filtering and bleaching oils and fats 7-8%, rotary-drilling mud 4-5%, and rubber and linoleum 2-3%. The production of clays of all kinds in Canada is so small as to be negligible, but there is a well established clay products industry which consumes something like 200,000 tons of imported clays. The clay industry of the United Kingdom is quite extensive, the output of low grade clays and shales amounting to 25,670,000 long tons in 1937; the higher grades included 2,739,000 tons of fireclay, 1,117,000 tons of china clay and ball clay.

For further details on bleaching clays *see* FULLER'S EARTH. (G. A. Ro.)

Cleveland, a city of North-east Ohio, occupies 73.74 sq.mi. with a population (1930) of 900,429, of which 597,603 were native whites, 229,487 foreign-born whites, and 71,899 Negroes. Estimated population in 1939, 948,730.

History.—In the non-partisan primary election October 3 two Republicans, Mayor Harold H. Burton and John E. O'Donnell, a member of the Cleveland Board of Education, were nominated to oppose each other in the mayoralty election. Two Democrats, William C. Dixon and Adam J. Damm, and a Communist, Mrs. Yetta Land, were defeated in the primary. Mayor Burton was re-elected on November 7, polling 141,858 votes to O'Donnell's 104,551.

Under the Burton administration Cleveland in the spring of 1939 was awarded a plaque by the United States Chamber of Commerce and the American Public Health Association for having the most effective program to meet health problems, and shared with Milwaukee the honours awarded by the National Safety Council for the "safest big city." The city in 1939 was setting a new record for fire prevention, the loss for the first eleven months of the year being only a trifle over \$500,000 as compared with \$1,998,000 for the same period in 1938 and the record, set in 1933, of \$846,644. The police department, in addition to its traffic safety campaign, reduced the city's major crime in 1939 to the lowest point in the 30 years the records have been kept. Partly respon-

sible for this record was the police department's two-way radio telephone system. In the first year it was in operation felonies were reduced about 20% and all major crime nearly 50%.

Many of the problems that faced the municipal administration in 1939 centred about the relief situation and the shortage of funds to handle it. (*See* OHIO). When the problem became acute late in November and early in December, and Gov. John W. Bricker refused to call a special session of the General Assembly, the situation was met by cutting relief rolls by one-quarter; reducing food allowances of the remainder by one-third; transferring funds that had been earmarked for other purposes; issuing bonds against delinquent taxes; and by action of the Federal Government in providing more Works Projects Administration jobs and carloads of food through the Federal Surplus Commodities Corporation.

Cleveland's city council throughout 1939 struggled with utility problems. Efforts to reach an agreement with the Cleveland Railway Co. on a new traction franchise failed, and under terms of the Tayler grant the company in January entered a 15-year liquidation period. Council's battle with the East Ohio Gas Co. for lower gas rates dragged on, but pending appeals and hearings the company won in the courts the right to increase its charges in Cleveland by about \$1,500,000 a year. Another rate battle is that between the council and the Cleveland Electric Illuminating Company. Council demanded a decrease in rates amounting to \$1,385,000 a year. The company refused to grant this and appealed to the State Utilities Commission.

Bishop Joseph Schrembs, head of the Cleveland Catholic diocese for 18 years, was elevated to the rank of archbishop by Pope Pius XII, March 30, 1939.

Education.—After restoring to teachers salary reductions that had been in effect through most of the depression, the Cleveland board of education in November found it had insufficient funds for the year. To prevent the schools from closing, the board delayed until 1940 payment of salaries of all its employees for the last six weeks of 1939.

Banking and Finance.—A development in Cleveland finance which attracted national attention was the fight waged by Otis and Co., Cleveland financial house, to establish the Middle West as an effective competitor of the East in financial underwriting. Leading a syndicate of banking houses, Otis and Co. bid for new issues of stocks and bonds of the Consumers Power Co., a Michigan subsidiary of Commonwealth and Southern Corp., and carried the fight to the Securities and Exchange Commission.

Trading on the Cleveland stock exchange was increased by two changes. On February 1 the daily trading period was lengthened one-quarter of an hour to 3:15 P.M. so the market was open later than eastern markets. In December, the Securities and Exchange Commission granted the request of the Cleveland exchange for unlisted trading privileges in 17 leading stocks.

Deposits in Cleveland banks on October 2 were \$819,977,066, the highest since the all-time peak was established in 1930. Two closed banks made liquidating dividend distributions in December. Depositors in the old Union Trust Co. received \$5,250,000, which was equal to 5% of deposits and brought the total paid to 85%. Depositors of the Standard Trust Co. also received a 5% payment, which amounted to \$370,000 and brought the total payment to 37½%.

Construction continued at a brisk pace in Cleveland through 1939. Erected with great speed, the \$7,000,000 Main avenue bridge across the Cuyahoga river was dedicated October 6 with ceremonies which were attended by a throng of 110,000. Work was begun on the \$3,300,000 Valley View housing project in May and on the \$3,000,000 Woodhill project in June, and the Cleveland Metropolitan Housing Authority announced that another housing group to cost \$1,000,000 would be built in Euclid, a suburb. Ground was

broken for the city's new \$6,500,000 generating station August 28, and the Cleveland Electric Illuminating Co. announced it would erect a \$6,300,000 power plant. On September 15 the cornerstone was laid for the new Central High school which will cost \$1,300,000.

Labour.—There were three outstanding strikes in Cleveland in 1939. Chain drug store clerks, pharmacists, warehouse and service employees walked out March 15 and this dispute was not settled until May 12. The Fisher Body plant was affected by the strike of the United Automobile Workers against the General Motors Corp., and a riot there July 31 sent nearly 50 persons to hospitals. Another U.A.W. strike took place in October at the Midland Steel Products Co., but lasted only a week. (P. By.)

Climate: see METEOROLOGY.

Clothing Industry. The clothing industry in 1939 recovered somewhat from the serious losses of 1938; production increased considerably. Spectacularly successful was sportswear with tremendous emphasis being placed on slack and shirt ensembles made of cottons, rayons, and worsteds. The trend toward comfort and ease in men's clothing continues unabated both in regular and sport clothing.

New machines appeared on the market including a new drilling machine for chalk marking, a high speed blind stitch machine, a newer and faster sewing machine and numerous special machines, all of which save hours of labour and turn out a neater, stronger product. Indications are for increased co-operation between textile mills, clothing manufacturers and retailers in an effort to supply the consumer with exactly what he desires. Synthetic fabrics are moving into the field with great rapidity. Reported are new laminated fabrics that require no weaving.

Competition between various types of closures has become intense; metal snap fasteners have entered the field to a rather generous extent, slide fasteners continue to drive ahead, button manufacturers are debating a campaign to educate the consumer.

Regular clothing manufacturers joined shirt and pants manufacturers in the slack and shirt ensemble business; work clothing houses likewise entered the sportswear field.

The European war has had an effect on the industry in many respects. Foreign textiles have lost much of their importance and American mills have decided to produce finer woollens. Importation of cotton has been curtailed and thread houses are unable to find the necessary Egyptian cotton. Foreign design influence is gone since foreign factories and designers have turned to military clothing. No volume of export business is reported.

Government regulation of the industry increased in 1939. Great discussion centres about proposed wage minimums, particularly in the cotton garment trade, where the Southern manufacturers have vigorously protested. Differentials between cotton and woollen operations are also bothersome.

Government research has been directed at the standardization of sizes for clothing, although no real practical formulae have yet been presented. A hip girth sizing system was proposed.

Up to and including Nov. 4, 1939, with about 60% (based on value) of the clothing industry reporting, total garments cut (including suits of wool, cotton, linen, mohair, trousers and knickers, overcoats, topcoats and separate coats, but not including dress pants, work clothes, shirts, leather garments, pajamas, and very heavy coats) in the men's, young men's and boys' industries totalled 26,461,375; a gain of more than 30% over 1938's period figure of 20,099,368 and comparing favourably with 1938's corrected full year figure.

English manufacturers had a good year as indicated by the rise of employment in the British industry. War activities have

changed British firms into primarily military uniform manufacturers. (H. SN.)

Cloves: see SPICES.

Coal Industry. Of a world total coal production estimated at 1,439,000,000 metric tons in 1938, 74% was concentrated in four countries: Germany 25%, United States 24%, United Kingdom 16%, and U.S.S.R. 9%. The comparative status of these major countries is shown in the accompanying graph. The second rank producers, 11 in number, controlled a total of 19%; France and Japan each had 3%, while Manchoukuo, which is under Japanese control, adds 1% to the latter; Poland, Czecho-Slovakia, Belgium, and India, ranging from 2.4% to 1.7%, averaged 2% each, although Czecho-Slovakia and Poland will now disappear as independent producers. South Africa, Netherlands, Canada, and Australia each had approximately 1%. This leaves 4% to be distributed among no less than 34 minor producers.

British Empire production is largely in Great Britain itself; the Empire total being 21%, with 16% in Great Britain, nearly 2% in India, about 1% each in South Africa, Canada, and Australia, there is only 0.6% remaining for other British territory; half of this is supplied by New Zealand, one-quarter by Southern Rhodesia, and the remainder by Malaya, Nigeria, Eire, and British Borneo.

Conditions are such (Jan. 1, 1940) that only a partial summary can be given on European producers during 1939, as statistics have been withheld in most cases since the outbreak of war.

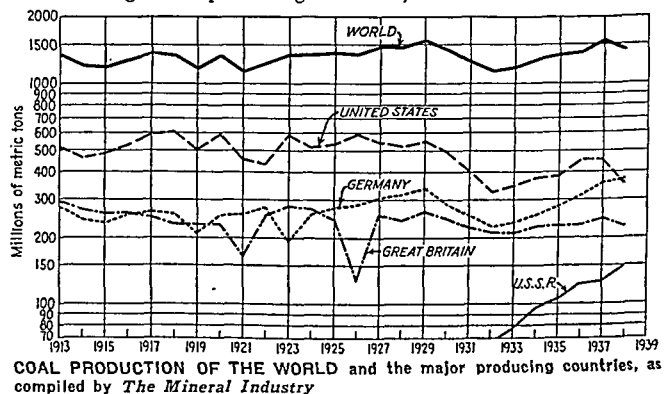
Coal Production of the World
(Millions of metric tons—all grades)

	1929	1932	1936	1937	1938
Canada	15.87	10.65	10.82	14.37	12.03
United States	552.31	326.10	443.29	447.58	351.50
Belgium	26.03	21.42	27.87	29.86	29.58
Czecho-Slovakia	20.08	26.82	28.18	34.67	26.60
France	68.49	57.70	46.17	45.33	47.56
Germany	348.61	227.39	318.15	372.70	384.92
Netherlands	11.74	12.88	12.89	14.46	13.66
Poland	46.31	28.87	29.76	36.24	38.11
United Kingdom	262.05	212.08	232.12	244.27	223.29
U. S. S. R.	38.42	53.60	123.70	127.00	132.89
China	?	28.00	27.05	?	?
India	22.50	20.48	23.55	26.09	29.48
Japan	36.14	28.22	45.07	?	?
South Africa	13.02	9.92	14.84	15.49	16.28
Australasia	14.88	13.21	16.82	18.03	16.70
Total	1,559.00	1,124.00	1,445.00	1,540.00	1,439.00

World Reserves.—The reserves of coal, i.e. coal that can be worked at a profit, known in the world are approximately as under:

Anthracite	600,000 million tons
Bituminous	4,000,000 " "
Lignite	3,000,000 " "

In the larger coal-producing countries, the coal seams are mostly





"THE FIDDLERS THREE." Elderman's view in *The Washington Post* of the national coal strike in April and May 1939

of carboniferous age, but vast quantities of lower-grade coal, such as lignite and brown coal, are available in Germany, Russia, Central Europe and Asia.

The superficial extent of the coal areas of the world has been estimated at 605,000 sq.mi., or in the ratio of 1 to 110 of the land surface of the globe, about one-third belonging to formations newer than carboniferous. Coal is found in all latitudes between Spitzbergen and the Antarctic continent, and is of better quality as a whole in the Old World than in the New, and coal of the Northern Hemisphere is superior to that of the Southern.

United States.—A period of uncertainty over wage agreements during April and May cut bituminous coal production to one-quarter the usual weekly rate for six weeks, but most of this loss of output was offset by an increase of over one-quarter above the average rate during the last quarter, as a result of generally increased industrial activity. Bituminous production for the year was 389,025,000 short tons, an increase of 13% over 344,630,000 tons in 1938.

Anthracite production improved by only 10%, from 46,099,000 tons in 1938 to 50,807,000 tons in 1939. This gives a grand total of 439,832,000 tons for 1939, an increase of 12.5% over 390,729,000 tons in 1938. Bituminous production averaged 9,550,000 tons weekly during the last quarter, against an average of 7,500,000 tons for the year; weekly anthracite output in the last quarter was just on a par with the annual average, but from mid-April to mid-May was nearly 50% above the annual average.

Industrial consumption of bituminous coal dropped from 26,185,000 tons in January to 20,518,000 tons in May, with improvement to 30,246,000 tons in November.

Considering coal as a whole, Pennsylvania is the foremost producing State, but eliminating anthracite and comparing only on a bituminous basis, Pennsylvania has lost the leading position, and West Virginia has taken its place. These two States alone pro-

duce more than half of the total bituminous output of the United States.

Distributed by fields, about 70% of the bituminous output comes from the Appalachian region (Pennsylvania, Ohio, West Virginia, Virginia, Eastern Kentucky and Tennessee), 20% from the Central region (Indiana, Illinois, Iowa, Missouri and Kansas), 6% from the Rocky Mountain and Western States, and 3% from the Southern field (Alabama).

Although there is some international trade in coal, the amounts are so small that the United States industry is practically self-contained; imports are usually under 1,000,000 tons and exports have ranged from a high of 24,000,000 tons in 1929 to a low of 10,000,000 tons in 1932, including bunker coal and the coal equivalent of coke exported. (See also FUEL BRIQUETTES.)

Great Britain.—Coal production in 1938 dropped 6% to 227,015,000 long tons, 3% of which was anthracite and 97% bituminous. Exports took 57% of the anthracite and 15% of the bituminous output, with bunker coal taking another 5%. All told, including the coal in coke and manufactured fuels, about 22% of the output was exported.

Production to Aug. 5, 1939 totalled 144,021,000 long tons, an increase of 3% over the same period of 1938; this is at a rate of approximately 247,000,000 tons annually, as compared with 227,015,000 tons in 1938. Since it is probable that war has increased the demand, it is likely that the year's total may exceed the above estimate; in fact it is possible that it may approach or even exceed the 1929 high of 257,907,000 tons, although it must be remembered that losses in export and bunker trade may offset some of the gains in domestic consumption. Through Aug. 1939 exports had declined 5% from the 1938 monthly average, bunkers had increased by 2%, and exports of coke and manufactured fuels had dropped 30%; the total decrease was 5%. The chief loss in British exports will be that to Germany, which took 10% of the 1938 exports.

In spite of the increased output, employment in the industry continued to decline, and on Aug. 5, 1939 was 765,200, or 1.2% less than a year previous, which would indicate some improvement in output per man-shift, which averaged 22.96cwt. in 1938.

Due to the open character of many colliery structures, required by the work being carried on in them, the control of lighting under Air Raid Precautions regulations presented some difficult problems, and some of the schemes to overcome the difficulties are novel and interesting. For outside lighting, ultra-violet light was adapted by painting nearby objects with a fluorescent paint; the light itself is invisible to the eye, and while the fluorescence renders the painted objects clearly visible in the immediate vicinity, they are indistinguishable at a distance.

For indoor lighting, to avoid the necessity of blocking windows and using artificial light in daytime, yellow sodium light may be used for illumination, with the windows treated with a blue varnish; the complementary character of the two colours prevents the yellow light from penetrating the blue varnish, and being visible from the outside, while the varnish still has a sufficient

United States Production of Coal
(Millions of Short Tons)

	1929	1932	1936	1937	1938
Alabama	17.9	7.9	12.2	12.4	11.0
Colorado	9.9	5.6	6.8	7.2	5.7
Illinois	60.7	33.5	50.9	51.6	40.7
Indiana	18.3	13.3	17.8	17.8	14.1
Kentucky	60.5	33.3	47.5	47.1	38.5
Ohio	23.7	13.9	24.1	25.2	17.9
Pennsylvania	143.5	74.8	109.9	111.0	77.0
Tennessee	5.4	3.5	5.1	5.2	4.4
Utah	5.1	2.9	3.2	3.8	2.9
Virginia	12.7	7.7	11.7	13.8	12.2
West Virginia	138.5	85.6	117.9	118.6	92.9
Wyoming	6.7	4.2	5.8	5.9	5.2
Others	32.1	21.5	26.2	25.9	20.1
Total Bituminous	535.0	309.7	439.1	445.5	344.6
Anthracite	73.8	49.9	54.6	51.9	46.1
Grand Total	608.8	359.6	493.7	497.4	390.7

transparency for sunlight to give a reasonable degree of illumination in daytime.

Germany.—German production in 1938 included 186,405,000 metric tons of bituminous coal and 198,511,000 tons of brown coal, a total of 384,916,000 tons, of which 366,764,000 tons were from Germany proper, 3,759,000 tons from the former Austria, and 14,393,000 tons from the Saar. Data available for 1939 are limited to bituminous coal for the first half, which was 94,062,000 tons, an increase of 2% over the same period of 1938. It is not clear whether this figure applies to the former area of the Reich, or to the current boundaries, but presumably the latter. Final figures for 1939 output may be expected to increase considerably above those for 1938, since they will include the former outputs of Czecho-Slovakia and Poland, which in 1938 were respectively 26,600,000 tons (about evenly divided between bituminous and brown coal), and 38,114,000 tons (practically all bituminous). The area now comprised in the new Reich had a total output of 449,630,000 tons in 1938, but this level can hardly have been maintained in 1939, for several reasons. It is a question as to what extent adverse effects on general consumption and export trade (which alone has been taking nearly 10% of the output) will be offset by increased demand by the war industries, but much more important is the extent to which sabotage and other related factors will have reduced the outputs in the former Czech and Polish mines.

Export trade is bound to suffer materially, as one-sixth of the past exports have been going to France. Another factor that will affect exports statistically is the extent of the trade that has in the past existed between Germany, Austria, Czecho-Slovakia, and Poland, most of which will now disappear from the export record, even though the trade itself still remains; this has amounted to a total only slightly less than the exports to France so that the total loss in recorded exports will reach considerable magnitude. Lack of ability to ship on the open seas will not seriously affect German exports, since the bulk of these has gone by land to European countries, or if by sea, to the Baltic countries. Less than 10% of the 1938 exports went outside the continent of Europe. In this connection it might also be well to mention that just as Germany will be cut off from imports from France, so also will she be barred from imports from Great Britain, which in the past has supplied large amounts of coal of grades lacking in Germany.

In the first partition Czecho-Slovakia lost to Germany about 54% of her former productive areas, including practically all of the brown coal, and another 21% was later lost to Poland; eventually, however, this latter went also to Germany, as well as the 25% still remaining at the final absorption of Moravia and Bohemia.

U.S.S.R. (Russia).—Russian production is estimated to have been 132,900,000 metric tons in 1938, 97,700,000 tons from European and 35,200,000 tons from Asiatic Russia. This was an increase of 5% over 1937. The division into types of coal has not been reported for several years, but is about 22% anthracite, 64% bituminous, and 14% brown coal. No data whatever are available on production in 1939. The Russian industry is practically self-contained, there being practically no imports, and very little surplus for export.

France.—French coal production is so far short of demand that imports amount to about one-half of production. The 1938 output included 46,502,000 metric tons of bituminous and 1,057,000 tons of brown coal, a total of 47,559,000 tons, and an increase of 5% over 1937; this was supplemented by imports of 18,705,000 tons of coal, 2,262,000 tons of coke and 1,034,000 tons of briquettes, equivalent to a total of about 23,000,000 tons of coal. During the first half of 1939 production rose to 26,014,000 tons, an

increase of 10% over the same period of 1938. Consumption remained practically unchanged, imports declining by about the same tonnage difference. In 1938 France imported 5,538,000 tons of coal, 985,000 tons of coke, and 242,000 tons of briquettes from Germany, and 1,570,000 tons of coal from Poland. This is equivalent to 8,825,000 tons of coal during the year from sources which are no longer available, and which must be made up from elsewhere.

Belgium.—Production in 1938 was 29,575,000 metric tons, a fractional decrease from 1937. The 1939 output seems to have been little affected by the war, as the October output was reported at 2,513,000 tons. Since 1936 imports have somewhat exceeded exports, but imports have been decreasing, and the import surplus for 1939 through August had shrunk to about 600,000 tons, from 4,200,000 tons in 1937.

Netherlands.—In 1938 the Dutch production dropped 5% to 13,659,000 metric tons, 99% of which was bituminous coal. Although Netherlands maintained imports in 1938 equalling 40% of production, exports were at a still higher rate, giving a 12% exports surplus, in addition to which a further 22% was used as bunker coal.

Canada.—Preliminary figures for 1939 show an increase in coal output to 15,507,000 short tons, as compared with 14,295,000 tons in 1938, a rise of 8%. Imports amount to almost as much as production, increasing in 1939 in a somewhat smaller proportion.

India.—Production in 1938 rose by about 10% to 29,000,000 long tons.

South Africa.—Production in 1938 increased 5% over 1937, to 17,950,000 short tons. Sales for the first three quarters of 1939 were 13,697,000 tons, or at the rate of 18,263,000 tons for the year.

Australasia.—The coal output of Australasia totalled 17,578,000 long tons in 1938, a decrease of 1% from 1937; of this, 88% was from Australia and 12% from New Zealand; the total included 72% of bituminous coal, and 28% of brown coal.

(G. A. Ro.)

Coast Guard, U.S. The activities of the United States Coast Guard in 1939 dealing with the saving of life and property may be summarized by stating that there were 9,383 instances of lives saved and vessels assisted, this being 658 more instances than during 1938; the total value of the vessels assisted, including cargoes, was \$63,723,566, and the number of persons on board the vessels assisted was 32,645. There were 10,615 instances of lives being saved or persons being rescued from peril, and an additional 4,858 instances where assistance of one form or another was rendered.

In carrying out its functions as the Federal maritime police agency and its duties of law enforcement, the Coast Guard boarded and examined the papers of 32,655 vessels, and it seized 6 vessels. The fines and penalties incurred by vessels reported amounted to \$470,081. Coast Guard vessels removed or destroyed 266 derelicts; they patrolled 443 marine parades and regattas; and Coast Guard officers examined 3,495 persons for certificates as life-boat men.

In the hurricane which struck the New England coast in Sept. 1938 the Coast Guard rendered assistance with all equipment available, rescuing 1,011 persons from positions of peril, and aiding 509 vessels. Emergency radio communication was provided, mail was transported, vessels and automobiles were recovered, and aerial surveys made. Three members of the service lost their lives incident to rescue activities.

The Coast Guard provided an armed detail for the guarding and supervision of the transfer of approximately 77,000,000 lb. of silver bullion by the Treasury Department from New York city to



AFTER TAKING ABOARD a ship's passenger stricken with pneumonia, this U.S. Coast Guard plane fell into the Atlantic July 15, 1939, killing both pilots and the sick man. Five others in the plane were rescued by the ship's crew

the depository at West Point, N.Y. Coast Guard cutters maintained the International ice patrol on the North Atlantic during the iceberg season, a duty to which they have been assigned since 1913, and while on this duty co-operated with the Weather Bureau in the study of the upper air conditions as a means of promoting greater safety in air navigation.

Under President Roosevelt's Reorganization Plan No. II, the Lighthouse Service, of the Department of Commerce, was transferred to and consolidated with the United States Coast Guard, in the Treasury Department. This consolidation, made in the interests of efficiency and economy, resulted in the transfer of the system of approximately 30,000 aids to marine navigation, including lighthouses, lightships, radiobeacons, fog signals, buoys and beacons. These aids are maintained upon the sea and lake coasts of the United States, on the navigable rivers of the country, and upon the coasts of all other territory under the jurisdiction of the United States with the exception of the Philippine islands and the Panama canal proper. Plans were in progress at the close of the fiscal year providing for a complete integration with the Coast Guard of the personnel of the Lighthouse Service, numbering about 5,200.

(R. R. W.)

Coast Guard Academy, U.S. During the calendar year 1939, the United States Coast Guard Academy, which is maintained for the professional education of young men who are candidates for commissions as officers in the Coast Guard, graduated 23 cadets who were commissioned ensigns in the Coast Guard on May 23, 1939. The annual competitive examination of applicants for appointment as cadets at the Coast Guard Academy for the class of 1943 was held on June 14, 1939. Of the 1,189 applicants who competed in this mental examination, 257 were successful in passing. In Aug. 1939, 88 appointments as cadets were made from those standing highest as a result of this examination.

In Sept. 1939, the Coast Guard was called upon to maintain a strict neutrality patrol as the result of the unsettled conditions in Europe. To carry out the enforcement of the neutrality laws, it became necessary to augment the personnel of the Coast Guard, and in anticipation of a continuing need, the class of 1943 was in-

creased at that time by 36 additional appointments. At the close of the year, the Coast Guard Academy had 207 cadets under instruction, the largest cadet corps in the history of the academy. This number included 21 in the first class, 25 in the second class, 39 in the third class, and 122 in the fourth class.

In its endeavour to improve constantly the curriculum at the academy, Professor H. L. Seward of Yale university, recognized as an outstanding authority in maritime matters, was appointed on Feb. 20, 1939, as head of the Department of Maritime Economics, this course assuming particular importance as officers of the Coast Guard now administer the United States Maritime Service, an organization training merchant officers and seamen of the American merchant marine. Two additional instructors were also added to the staff of the academy as the result of the increase in the cadet corps.

The annual visit to the Coast Guard Academy by the Congressional Board of Visitors, required by law, was made on April 20, 1939. The board, which was composed of three Senators and four Congressmen, was very favourably impressed with the academy and the administration thereof, and found it to be a thoroughly modern educational institution of high standards.

In a manner analogous to the practice at the United States Naval Academy, the Coast Guard cadets of the first and third classes made the annual practice cruise during the months of June, July, and August aboard the Coast Guard Cutter "Bibb" to a number of ports on the western coast of South America. The cadets of the second class made a similar cruise to ports in New England and eastern Canada.

(R. R. W.)

Coaxial Cables: see TELEPHONE: *Coaxial Cable.*

Cobalt. There was no great commercial importance attached to the metal cobalt until the early years of the nineteenth century, when extensive deposits were discovered in Ontario (Canada), which yielded a plentiful supply of a metal heretofore obtained only in small quantities as a by-product in the smelting of other metals, and stimulated the development of new uses. For a time Canada supplied most of the world's demand, but more recently even more extensive deposits have been discovered in Northern Rhodesia, Belgian Congo, and French Morocco. Canada produced 209 metric tons in 1938, and Northern

Rhodesia 1,461 tons. Cobalt is now produced to the extent of some 3,000 metric tons annually, about half of which is used as metal, and the other half in compound form. The chief metal use is in the so-called stellite alloys, combinations of cobalt and chromium, with sometimes other metals added, and in special alloy steels, mainly for permanent magnets. The main compound utilized is the oxide, which has long been used as a blue colouring agent in the glass and ceramic industries, while smaller amounts of other compounds are used as driers in paint and varnish.

(G. A. Ro.)

Cochin-China: see FRENCH COLONIAL EMPIRE.

Cocoa (CACAO). Exports of principal cocoa-producing countries are given by the International Institute of Agriculture as follows for the 11 months from Oct. 1, 1938, to Aug. 31, 1939, and for the similar period ending Aug. 31, 1938:

Cocoa Exports from Principal Producing Countries
(in Thousands of Pounds)

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Brazil	195,901†	188,250†
Ivory Coast	102,533†	100,392†
Cameroons, Fr.	63,396†	50,755†
Dominican Republic	52,060†	34,412†
Ecuador	28,067†	29,866†
Sao Thomé & Principe Islands	20,501*	21,215*
Togo, Fr.	17,977†	8,159†
Trinidad	15,243*	36,436*
Ceylon	7,392	8,353
Grenada	6,025†	7,663†
Haiti	3,935*	3,298*
Netherlands Indies	2,297*	2,436*
Madagascar	690†	495†

*Oct. 1 to July 31, of year noted.
†Oct. 1 to June 30, of year noted.

†Oct. 1 to May 31, of year noted.
(S. O. R.)

Coco-Nuts. World production of coco-nuts, in copra equivalent, is approximately 7,333,000,000lb. a year, the United States Department of Commerce reported in 1939 in its regular consular advices on food production and trade throughout the world. Of this, 22% is produced by the Philippine Islands, 25% by Netherlands Indies, 18% by British India, 9% by Ceylon, and 8% by Malaya. Practically all coco-nut oil and copra imported into the United States is from the Philippines, owing to the fact that excise taxes on such products are rebated back to the Philippine Government by the United States, thus giving the Philippines an advantage. Imports of coco-nut oil into the United States approximate 350,000,000lb. annually; copra, about 500,000,000 pounds. Coco-nut oil and copra are included in the vegetable oils, of which the British Food Ministry took complete charge following the outbreak of war in September, to safeguard supplies of cooking fats and to prevent wide fluctuations in prices. In Jamaica, exports of copra and oil were prohibited, at the outbreak of war, to conserve the supply of oil for manufacturing oleomargarine, cooking fats and soap and to do away with the necessity of importing those products. In the Netherlands Indies early in 1939 the governor general announced an ordinance to prevent natives of Celebes from losing their coco-nut plantations as a result of binding themselves by contracts with copra dealers.

(S. O. R.)

Coelacantha: see AQUARIUMS; ZOOLOGY; for picture see MARINE BIOLOGY.

Coffee. The outbreak of war Sept. 1939, with its loss and curtailment of coffee markets, so demoralized the foremost industry of Brazil, coffee production, that the Government declared a four-day holiday as an antidote to panic psychology. Immediately, however, orders for coffee flowed into Brazil, owing

to the announcement of steamship companies that cargo rates would be advanced approximately 25% on October 1 because of war risks. September shipments of coffee from Brazil were 1,575,315 bags, the largest monthly shipment in many years. Heavy war-scare buying also caused reshipments of coffee from the United States to Scandinavian countries and Italy. Germany imported 1,529,828 bags of coffee in 1938. War blockade closed that market to Brazil. Coffee substitutes, known as "60-40s," were in use in Germany some months before the outbreak of war. Coffee shippers in Sept. 1939 were in a much better position than at the beginning of war in 1914, as they had only about 2,700,000 bags of coffee in Europe in 1939, whereas in 1914 they had approximately 8,000,000 bags, much of which was confiscated. As a result of war restrictions on credit the Venezuelan Government announced a loan of 4,000,000 bolivares (\$1,260,000) to coffee planters. The National Coffee Department in Brazil has arranged war risk insurance. Indemnities are to be paid in coffee, taken from the annual surplus that otherwise would be destroyed to keep it off the market. From June 1931 to June 15, 1939, Brazil destroyed 66,434,000 bags of coffee in its national coffee control program. Exports from Brazil for the crop years ending June 30, were 16,384,286 bags in 1939 and 14,616,289 bags in 1938 (bags of 60 kilos each). World deliveries of coffee for the crop years ending June 30, 1939 and 1938, were reported by the New York Coffee and Sugar Exchange as follows, in bags of 132lb. each:

	1939	1938
	bags	bags
World	26,727,107	25,471,714
United States	13,817,107	12,564,714
Europe	11,598,000	11,517,000
Elsewhere	1,312,000	1,390,000

Canada on September 12 imposed a war revenue tariff of 10 cents a pound on imports of coffee grown in British possessions, which previously had been admitted duty free. Coffee from other countries, which had under favoured nations' agreements paid a duty of 3 cents a pound, was raised to a duty of 13 cents a pound. Canada imports about 40,000,000lb. of coffee annually. (See also BRAZIL; GUATEMALA.)

(S. O. R.)

Coiffures: see FASHION AND DRESS.

Coinage. The United States Mint service is an adjunct of the Treasury Department. It consists of eight field institutions in widely scattered localities, administered by the Director of the Mint, from the Bureau of the Mint in Washington. The eight institutions are three coinage mints, located in Philadelphia, Pa., Denver, Colo., and San Francisco, California; assay offices in New York, Seattle, Wash., and New Orleans, La.; a bullion depository for storage of gold, at Fort Knox, Ky., and a bullion depository for storage of silver, at West Point, New York.

Coinage.—Coinage manufactured by the U.S. Mints for the United States during the calendar year 1939, amounted to 674,089,105 pieces, valued at \$38,289,169.80.

Half dollars	13,655,934 pieces
Quarter dollars	43,268,795 pieces
Dimes	102,683,321 pieces
Nickels	130,771,535 pieces
Cents	383,709,520 pieces

The nickel was the Jefferson design, adopted in 1938; it superseded the Buffalo nickel, which, however, continues in circulation.

All Mint records for monthly coinage in the United States, were broken in Oct. 1939, when 126,977,909 pieces were struck, the largest production in any one month since the founding of the Mint in 1792. November production was the second largest in Mint history, reaching 124,242,518 pieces.

Coinage executed for foreign Governments amounted to 15,725,-

ooo pieces. The U.S. Mints, in 1939, executed coins for Cuba, the Dominican Republic, and Honduras.

Gold and Silver Acquisitions.—Gold acquisitions by the Mints and Assay Offices of the United States, during the calendar year 1939, amounted to approximately \$3,132,000,000. Silver acquisitions of the Mints and Assay Offices of the United States in 1939 amounted to 343,620,000 ounces (approximate). (N. T. R.)

Coke. The production of coke centres in the more heavily industrialized countries, particularly those with a large pig iron output. World production, including both oven coke and gas-house coke, increased about 11% in 1937, to an estimated 191,000,000 metric tons, the approximate distribution being: United States 28%; Germany 25%; United Kingdom 15%; U.S.S.R. 11%; France 5%; Belgium 3%; Japanese Empire 2%; Netherlands 2%; Czechoslovakia 2%; India, Canada, Poland, and Italy 5%. Figures are incomplete for 1938, but there was a decrease of probably about 10%, most of which was in the United States.

The United States produced 32,633,000 short tons of oven coke in 1938, of which 98% was by-product and 2% beehive; this is a decrease of 38% from 1937. Of the total, 55% was used in the production of pig iron and ferro-alloys. Production recovered somewhat in 1939, the output for the first 10 months being 14% above that for the corresponding period in 1937. Foreign trade plays very little part in the industry, exports and imports each being of the order of 1% of the output. Coke production took 14% of the bituminous coal production of the United States in 1937, aside from that used in gas works.

After the United States, Germany is the next largest producer of coke; in 1938 oven coke increased 6% to 43,511,000 metric tons; in addition, gas works coke is approximately 5,000,000 tons, and brown-coal coke 2,000,000 tons. Germany is a heavy exporter of coke, but net exports in 1938 took only 12% of the output, as against 20% in 1937.

Coke production increased 6% in the United Kingdom in 1937, to 29,045,000 long tons; gas-house coke is much more important there than in other countries, making up 45% of the total, while by-product coke is 54%, leaving 1% for beehive ovens. Coke production consumed 13% of the bituminous coal output in 1937. Coke exports were 2,450,000 tons, or 8% of the total output.

(G. A. Ro.)

Colchicine: see HORTICULTURE.

Cold, Common. Variation in individual resistance is recognized as an important factor in the acquisition of the common cold. Locke made more than 1,000 tests on healthy students observing the oxygen-use under standard exertion and recorded the incidence of colds in the same subjects. He then compared the efficiency of performance with the frequency of reported colds. He succeeded in demonstrating a correlation between the ability to avoid the common cold in man and the ability to maintain a capacity for good response to effort and exposure, which had previously been shown to indicate maximal ability to resist infection in the rabbit. It was therefore suggested that the causal agent in the common cold may be capable of precipitating onset most readily when normal defence has been made temporarily vulnerable as the result of fatigue.

Most of the latest articles on vaccines for prevention of colds have continued to reflect unfavourable views. As the result of an army study, Blitch and Doyle concluded that cold vaccines as today available do not prevent colds or their complications, nor do they cut down on the duration or severity of the illness to any appreciable extent. Hauser and Hauser in a controlled study of students at the University of Michigan, with the subjects

divided into three groups, found that over 66% of those subjects who received sterile water instead of vaccine stated they had fewer colds than during the preceding year. Over 64% of those who had received the vaccine intradermally similarly considered themselves improved, and 80% of those who received the vaccine subcutaneously reported a like effect. Although the report of improvement was greater in the group receiving the vaccine subcutaneously, the percentage difference was within the limits of possible error.

An attempt was made by a large industrial concern to estimate the value of some current methods of cold prophylaxis on over 1,600 employees. The only method found of any value was ultra-violet irradiation (sun lamp) which, it was believed, reduced both the severity and the number of colds in the employees so treated. Cathartics are still frequently given for colds, but in an army study no evidence was obtained that either castor oil or magnesium sulphate shortened the duration of acute upper respiratory disease, and in fact these drugs appeared to prolong recovery. No striking new local treatment has been discussed. The tendency is to return to general measures as outlined by Bock: "Common-sense treatment of acute upper respiratory tract infections, including the common cold, with or without fever, requires bed care, a return to the principle established by Hippocrates. Time, trouble, and money will often be saved by the early institution of this method. Whatever the specific etiological factors may be, it appears clear to us that fatigue of body and mind in adult patients plays a role in the precipitation of these infections not generally recognized. The main principle of treatment should be rest."

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College Baseball: see BASEBALL: *College Baseball*.

Colleges and Universities: see UNIVERSITIES AND COLLEGES.

Collier, Barron (1873-1939), U.S. advertising executive, was born March 23 in Memphis, Tenn., and was educated in the public schools of Memphis and at Oglethorpe university, Atlanta, Georgia. In 1890 he joined an advertising firm in Memphis. Ten years later he moved to New York city, where he organized his own company. At the time of his death he was president of 14 advertising companies and real estate brokerages and was reputedly the largest land-owner in Florida. The best known of his organizations was Barron G. Collier, Inc., brokers for advertising space in the cars of many municipal transportation systems. Collier, who was decorated by seven foreign nations, died March 13 in New York city.

Colombia, a republic in northern South America bordering Spanish; capital, Bogota; president, Eduardo Santos; area, 448,794 square miles. The population according to the census of April 1938 (made public in 1939), is 8,724,839. The principal cities are: Bogota, 331,400; Medellin, 170,622; Barranquilla, 152,348; Cali, 110,579; Cartagena, 86,197; Manizales, 83,346; Ibague, 61,860; Cucuta, 57,251; Bucaramanga, 49,891; Pasto, 49,533; Neiva, 34,699; Santa Marta, 33,163; Popayan, 24,479; Tunja, 20,417. The areas of densest population are the eastern Andean plateau, the interior departments of Antioquia and Caldas, and the upper Cauca valley.

History.—In 1939, under the administration of President San-

Rhodesia 1,461 tons. Cobalt is now produced to the extent of some 3,000 metric tons annually, about half of which is used as metal, and the other half in compound form. The chief metal use is in the so-called stellite alloys, combinations of cobalt and chromium, with sometimes other metals added, and in special alloy steels, mainly for permanent magnets. The main compound utilized is the oxide, which has long been used as a blue colouring agent in the glass and ceramic industries, while smaller amounts of other compounds are used as driers in paint and varnish.

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Togo, Fr.	17,977†	8,159†
Trinidad	15,243*	36,436*
Ceylon	7,392†	8,353
Grenada	6,025†	7,663†
Haiti	3,935*	3,293*
Netherlands Indies	2,297*	2,436*
Madagascar	690†	465†

*Oct. 1 to July 31, of year noted.
†Oct. 1 to June 30, of year noted.

‡Oct. 1 to May 31, of year noted.
(S. O. R.)

Coco-Nuts. World production of coco-nuts, in copra equivalent, is approximately 7,333,000,000 lb. a year, the United States Department of Commerce reported in 1939 in its regular consular advices on food production and trade throughout the world. Of this, 22% is produced by the Philippine Islands, 25% by Netherlands Indies, 18% by British India, 9% by Ceylon, and 8% by Malaya. Practically all coco-nut oil and copra imported into the United States is from the Philippines, owing to the fact that excise taxes on such products are rebated back to the Philippine Government by the United States, thus giving the Philippines an advantage. Imports of coco-nut oil into the United States approximate 350,000,000 lb. annually; copra, about 500,000,000 pounds. Coco-nut oil and copra are included in the vegetable oils, of which the British Food Ministry took complete charge following the outbreak of war in September, to safeguard supplies of cooking fats and to prevent wide fluctuations in prices. In Jamaica, exports of copra and oil were prohibited, at the outbreak of war, to conserve the supply of oil for manufacturing oleomargarine, cooking fats and soap and to do away with the necessity of importing those products. In the Netherlands Indies early in 1939 the governor general announced an ordinance to prevent natives of Celebes from losing their coco-nut plantations as a result of binding themselves by contracts with copra dealers.

(S. O. R.)

Coelacantha: *see* AQUARIUMS; ZOOLOGY; for picture *see* MARINE BIOLOGY.

Coffee. The outbreak of war Sept. 1939, with its loss and curtailment of coffee markets, so demoralized the foremost industry of Brazil, coffee production, that the Government declared a four-day holiday as an antidote to panic psychology. Immediately, however, orders for coffee flowed into Brazil, owing

to the announcement of steamship companies that cargo rates would be advanced approximately 25% on October 1 because of war risks. September shipments of coffee from Brazil were 1,575,315 bags, the largest monthly shipment in many years. Heavy war-scare buying also caused reshipments of coffee from the United States to Scandinavian countries and Italy. Germany imported 1,529,828 bags of coffee in 1938. War blockade closed that market to Brazil. Coffee substitutes, known as "60-40s," were in use in Germany some months before the outbreak of war. Coffee shippers in Sept. 1939 were in a much better position than at the beginning of war in 1914, as they had only about 2,700,000 bags of coffee in Europe in 1939, whereas in 1914 they had approximately 8,000,000 bags, much of which was confiscated. As a result of war restrictions on credit the Venezuelan Government announced a loan of 4,000,000 bolivares (\$1,260,000) to coffee planters. The National Coffee Department in Brazil has arranged war risk insurance. Indemnities are to be paid in coffee, taken from the annual surplus that otherwise would be destroyed to keep it off the market. From June 1931 to June 15, 1939, Brazil destroyed 66,434,000 bags of coffee in its national coffee control program. Exports from Brazil for the crop years ending June 30, were 16,384,286 bags in 1939 and 14,616,289 bags in 1938 (bags of 60 kilos each). World deliveries of coffee for the crop years ending June 30, 1939 and 1938, were reported by the New York Coffee and Sugar Exchange as follows, in bags of 132 lb. each:

	1939	1938
	bags	bags
World	26,727,107	25,471,714
United States	13,817,107	12,504,714
Europe	11,598,000	11,517,000
Elsewhere	1,312,000	1,390,000

Canada on September 12 imposed a war revenue tariff of 10 cents a pound on imports of coffee grown in British possessions, which previously had been admitted duty free. Coffee from other countries, which had under favoured nations' agreements paid a duty of 3 cents a pound, was raised to a duty of 13 cents a pound. Canada imports about 40,000,000 lb. of coffee annually. (*See* also BRAZIL; GUATEMALA.)

(S. O. R.)

Coiffures: *see* FASHION AND DRESS.

Coinage. The United States Mint service is an adjunct of the Treasury Department. It consists of eight field institutions in widely scattered localities, administered by the Director of the Mint, from the Bureau of the Mint in Washington. The eight institutions are three coinage mints, located in Philadelphia, Pa., Denver, Colo., and San Francisco, California; assay offices in New York, Seattle, Wash., and New Orleans, La.; a bullion depository for storage of gold, at Fort Knox, Ky., and a bullion depository for storage of silver, at West Point, New York.

Coinage.—Coinage manufactured by the U.S. Mints for the United States during the calendar year 1939, amounted to 674,089,105 pieces, valued at \$38,289,169.80.

Half dollars	13,655,934 pieces
Quarter dollars	43,268,795 pieces
Dimes	102,683,321 pieces
Nickels	130,771,535 pieces
Cents	383,709,520 pieces

The nickel was the Jefferson design, adopted in 1938; it superseded the Buffalo nickel, which, however, continues in circulation.

All Mint records for monthly coinage in the United States, were broken in Oct. 1939, when 126,977,909 pieces were struck, the largest production in any one month since the founding of the Mint in 1792. November production was the second largest in Mint history, reaching 124,242,518 pieces.

Coinage executed for foreign Governments amounted to 15,725,-

ooo pieces. The U.S. Mints, in 1939, executed coins for Cuba, the Dominican Republic, and Honduras.

Gold and Silver Acquisitions.—Gold acquisitions by the Mints and Assay Offices of the United States, during the calendar year 1939, amounted to approximately \$3,132,000,000. Silver acquisitions of the Mints and Assay Offices of the United States in 1939 amounted to 343,620,000 ounces (approximate). (N. T. R.)

Coke. The production of coke centres in the more heavily industrialized countries, particularly those with a large pig iron output. World production, including both oven coke and gas-house coke, increased about 11% in 1937, to an estimated 191,000,000 metric tons, the approximate distribution being: United States 28%; Germany 25%; United Kingdom 15%; U.S.S.R. 11%; France 5%; Belgium 3%; Japanese Empire 2%; Netherlands 2%; Czechoslovakia 2%; India, Canada, Poland, and Italy 5%. Figures are incomplete for 1938, but there was a decrease of probably about 10%, most of which was in the United States.

The United States produced 32,633,000 short tons of oven coke in 1938, of which 98% was by-product and 2% beehive; this is a decrease of 38% from 1937. Of the total, 55% was used in the production of pig iron and ferro-alloys. Production recovered somewhat in 1939, the output for the first 10 months being 14% above that for the corresponding period in 1937. Foreign trade plays very little part in the industry, exports and imports each being of the order of 1% of the output. Coke production took 14% of the bituminous coal production of the United States in 1937, aside from that used in gas works.

After the United States, Germany is the next largest producer of coke; in 1938 oven coke increased 6% to 43,511,000 metric tons; in addition, gas works coke is approximately 5,000,000 tons, and brown-coal coke 2,000,000 tons. Germany is a heavy exporter of coke, but net exports in 1938 took only 12% of the output, as against 20% in 1937.

Coke production increased 6% in the United Kingdom in 1937, to 29,045,000 long tons; gas-house coke is much more important there than in other countries, making up 45% of the total, while by-product coke is 54%, leaving 1% for beehive ovens. Coke production consumed 13% of the bituminous coal output in 1937. Coke exports were 2,450,000 tons, or 8% of the total output.

(G. A. Ro.)

Colchicine: see HORTICULTURE.

Cold, Common. Variation in individual resistance is recognized as an important factor in the acquisition of the common cold. Locke made more than 1,000 tests on healthy students observing the oxygen-use under standard exertion and recorded the incidence of colds in the same subjects. He then compared the efficiency of performance with the frequency of reported colds. He succeeded in demonstrating a correlation between the ability to avoid the common cold in man and the ability to maintain a capacity for good response to effort and exposure, which had previously been shown to indicate maximal ability to resist infection in the rabbit. It was therefore suggested that the causal agent in the common cold may be capable of precipitating onset most readily when normal defence has been made temporarily vulnerable as the result of fatigue.

Most of the latest articles on vaccines for prevention of colds have continued to reflect unfavourable views. As the result of an army study, Blitch and Doyle concluded that cold vaccines as today available do not prevent colds or their complications, nor do they cut down on the duration or severity of the illness to any appreciable extent. Hauser and Hauser in a controlled study of students at the University of Michigan, with the subjects

divided into three groups, found that over 66% of those subjects who received sterile water instead of vaccine stated they had fewer colds than during the preceding year. Over 64% of those who had received the vaccine intradermally similarly considered themselves improved, and 80% of those who received the vaccine subcutaneously reported a like effect. Although the report of improvement was greater in the group receiving the vaccine subcutaneously, the percentage difference was within the limits of possible error.

An attempt was made by a large industrial concern to estimate the value of some current methods of cold prophylaxis on over 1,600 employees. The only method found of any value was ultra-violet irradiation (sun lamp) which, it was believed, reduced both the severity and the number of colds in the employees so treated. Cathartics are still frequently given for colds, but in an army study no evidence was obtained that either castor oil or magnesium sulphate shortened the duration of acute upper respiratory disease, and in fact these drugs appeared to prolong recovery. No striking new local treatment has been discussed. The tendency is to return to general measures as outlined by Bock: "Common-sense treatment of acute upper respiratory tract infections, including the common cold, with or without fever, requires bed care, a return to the principle established by Hippocrates. Time, trouble, and money will often be saved by the early institution of this method. Whatever the specific etiological factors may be, it appears clear to us that fatigue of body and mind in adult patients plays a role in the precipitation of these infections not generally recognized. The main principle of treatment should be rest."

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College Baseball: see BASEBALL: *College Baseball*.

Colleges and Universities: see UNIVERSITIES AND COLLEGES.

Collier, Barron (1873–1939), U.S. advertising executive, was born March 23 in Memphis, Tenn., and was educated in the public schools of Memphis and at Oglethorpe university, Atlanta, Georgia. In 1890 he joined an advertising firm in Memphis. Ten years later he moved to New York city, where he organized his own company. At the time of his death he was president of 14 advertising companies and real estate brokerages and was reputedly the largest land-owner in Florida. The best known of his organizations was Barron G. Collier, Inc., brokers for advertising space in the cars of many municipal transportation systems. Collier, who was decorated by seven foreign nations, died March 13 in New York city.

Colombia, a republic in northern South America bordering both the Pacific and the Caribbean; language, Spanish; capital, Bogota; president, Eduardo Santos; area, 448,794 square miles. The population according to the census of April 1938 (made public in 1939), is 8,724,839. The principal cities are: Bogota, 331,400; Medellin, 170,622; Barranquilla, 152,348; Cali, 110,579; Cartagena, 86,197; Manizales, 83,346; Ibague, 61,860; Cucuta, 57,251; Bucaramanga, 49,891; Pasto, 49,533; Neiva, 34,699; Santa Marta, 33,163; Popayan, 24,479; Tunja, 20,417. The areas of densest population are the eastern Andean plateau, the interior departments of Antioquia and Caldas, and the upper Cauca valley.

History.—In 1939, under the administration of President San-

tos, Colombia continued the progressive development instituted under his predecessors. Politically, the most outstanding event was the decision of the Conservative Party to resume active participation in politics after an abstinence of nearly nine years. The marked freedom of the press and the willingness of the politically dominant Liberal Party to tolerate criticism and opposition gave promise of a continuance of Colombia's record, unique in Latin America, of constitutional government and unbroken acquiescence in the verdict of the ballot box for over a third of a century.

The country showed notable progress in internal development in 1939. An extensive program of asphaltting the nation's trunk highways was begun. Completion of extensive harbour works at Barranquilla, the principal port, just inside the mouth of the Magdalena river, made possible for the first time the unloading there of ocean-going vessels instead of at Puerto Colombia seven miles away on the sea. Much-needed waterworks were put into service in Bogota and in Cartagena. Dwarfing all else in internal development, however, was the completion of a 263-mi. pipe line connecting the rich Barco concession, one of the world's greatest oil fields, with the new port of Covenas on the Caribbean. This completed an epic engineering battle during which 12-in. pipe, much of it transported by air, was laid through a 5,284-ft. pass in the Andes and across the steaming jungles of the Catatumbo and Magdalena basins, part of the way in the face of attack by the fierce and primitive Motilón Indians. An original daily delivery of 25,000 bbl. of oil at Covenas will eventually be increased, it is planned, to 70,000 bbl. a day.

Throughout 1939 Colombia continued to maintain the friendly relations with the United States which had characterized her foreign policy for over a decade. President Santos' formal declaration for closer co-operation with the United States and other American nations was enthusiastically supported in congress and in the press, despite some fears that the Roosevelt Good Neighbour Policy, which Colombia has thoroughly approved, might be adversely affected by subsequent political changes in the United States. Conversely, there was general opposition to the program of the totalitarian nations, and especially to their activities in the Americas.

With the outbreak of war in Europe, Colombia took steps to defend her interests and her neutrality. On September 5, radio stations were ordered to broadcast only in Spanish and to observe strict neutrality in news presentation. In October, partly at the instigation of the United States, and motivated mainly by considerations of Panama canal defence, Colombia formally nationalized the German-controlled German-Colombian Air Transport Co. (the "Scadta"), oldest commercial air transport system in Latin America, which had employed German reserve officers as pilots. The Colombian Government's action resulted in the formation of the Colombian Air Navigation Co., directed by a Colombian and staffed by North American and Colombian pilots. The close co-operation of Colombia and the United States in military and naval matters was further marked by the visit (in April) of five Colombian officers to the Panama canal, where they virtually became part of the American military organization during a week of observation. An outstanding development of 1939 in Colombia's relations with her Latin American neighbours was her move to raise her legation in Ecuador to the rank of embassy. Ecuador, whose relations with Colombia had been extremely cordial, reciprocated.

Education.—In 1937 there were 8,714 primary schools (enrolment 573,617), largely supported by the national or local Governments; and 436 secondary (enrolment 32,585), over 80% of them privately controlled, although with Government financial assistance and determination of standards. There are several universities of which the National university, at Bogota, and the Univer-

sity of Medellin are the most important.

Finances.—The monetary unit is the peso (value: 58 cents U.S.). A scheduled \$8,000,000 loan to Colombia was held up by the U.S. Export-Import Bank because Colombia had not resumed service on that part of its external debt held in the United States. Colombia attributed this failure not to unwillingness on her part to resume payments, but rather to her inability to reach a satisfactory agreement with economy as a result of the outbreak of the European war in September.

Trade and Communication.—Colombia has external communication by sea mainly through Cartagena, Barranquilla, and Santa Marta on the Caribbean, and through Buenaventura and Tumaco on the Pacific, and by international air transport. Highways connect the country with its neighbours Venezuela and Ecuador. Air transport is very important in internal communication, due to the inadequacy of land routes from the coast to the main centres of population. In 1937, 4,260 mi. of highway were in operation. Railroads in operation totalled 1,984 miles. Three short aerial cable-ways for the transport of freight and passengers measured 88 miles. The Magdalena river remains an important artery of commerce, despite difficulties of navigation during the dry season.

In 1938, imports (largely textiles and other manufactured goods) totalled 159,259,000 pesos (6.1% loss from 1937), with the United States leading (46.9%), followed by Great Britain and Germany. Exports were 168,637,000 pesos including 18,780,402 in gold bars (a decline of 8.4% from 1937), with the United States taking 59%, followed by Germany (17.3%), and Great Britain (12.3%). In 1937 coffee comprised 55.8% of all exports, petroleum 22.1%, gold 11.1%, bananas 5.2%, and hides 2.3%. In 1939, there was a considerable increase in petroleum exports; while the extensive oil development clearly increased the importation of machinery and manufactured goods. Colombia avoided serious disruption of her economy as a result of the outbreak of the European war in September because of her predominant commercial connections with the United States. Colombian trade with Germany ceased completely, and the United States tended to absorb it as well as most of the other belligerents' shares.

Agriculture and Mineral Production.—In addition to the principal agricultural exports, Colombia produces sugar, wheat, rice, cotton, cacao, and tobacco, largely for domestic consumption. The pastoral industry produces annually about 3,000,000 pesos value of hides for export. Mineral resources are extensive. Colombia is ninth in world petroleum production (22,998,000 bbl. in 1939, 21,660,720 in 1938). In platinum she is second, and first in emeralds, while gold also is mined in considerable quantity. Manufacturing for domestic consumption has advanced under the protective tariff policy, and employs 300,000 persons.

(L. W. BE.; J. F. KL.)

Colorado, a Rocky Mountain State of the United States, popularly known as the "Centennial State," admitted to the Union 1876; area 103,658 sq.mi., one-third occupied by mountains; population (1930) 1,035,791 and estimated (1937) at 1,071,000; equally divided between urban and rural; 961,117 whites, 57,676 Mexicans, 11,828 Negroes, 1,395 Indians, other races 3,775; native-born whites 875,711, foreign-born whites 85,406. Capital and largest city, Denver, 287,861.

History.—State officers are: Ralph L. Carr (R.), governor; John C. Vivian (R.), lieutenant-governor; George E. Saunders (D.), secretary of State; Homer F. Bedford (D.), State auditor; Charles M. Armstrong (R.), State treasurer; Byron G. Rogers (D.), attorney-general; Mrs. Inez Johnson Lewis (D.), State superintendent of public instruction. In the 32nd General Assem-

bly, adjourned in April 1939, the Senate was Democratic and the House Republican. Principal legislative measure with political significance was the diversion of a portion of income tax receipts into the State general fund to offset demands of public assistance program, such receipts having previously gone to school fund.

Public Assistance.—In Jan. 1939, 57,587 cases were receiving public assistance (pensions, aid to dependent children, aid to the blind, tuberculous hospitalization, and direct relief), the cost of these agencies during 1938 having been over \$18,000,000, including \$6,710,000 in Federal grants. The number receiving old-age pensions increased from 34,604 at the beginning of 1938 to 39,369 in Sept. 1939. Although the pension amendment, twice upheld by popular vote, provides for \$45 a month, the average of 1938 payments was \$29.99, due to insufficient income. Colorado's pension payments are the second highest in the United States.

Water Development.—In 1939 one large storage reservoir was completed and two others were well under way, all designed to store surplus flood waters for late summer irrigation. A \$44,000,000 project for the diversion of Colorado river waters through a 13-mi. tunnel to supplement the flow of the South Platte through rich irrigated areas was commenced, and on the lower Arkansas river, near the Kansas line, a flood-control project to cost more than \$10,000,000 was inaugurated.

Highways.—In 1939 the State completed its \$25,000,000 highway program, financed by the issuance of anticipation warrants against future gasoline tax collections. Including Federal aid, construction total for 1938 was \$13,676,000 and for 1939, \$9,009,000. Although tremendously advanced, the program of essential highway construction is not yet considered complete.

Public Buildings.—Largely with Federal aid through PWA, the State's \$12,000,000 program of new buildings at 19 State institutions was 85% complete at the end of 1939. State financing was accomplished by means of tax anticipation warrants authorized by the legislature in 1937.

Charities and Correction.—State Hospital for the Insane, two homes and training schools for mental defectives, soldiers' and sailors' home, two industrial schools for boys and girls, workshop for the blind, Colorado General hospital, State Psychopathic hospital, State penitentiary, State reformatory and State Home for Dependent and Neglected Children.

Agriculture, Manufactures, Mineral Production.—Farm products, \$116,000,000; manufactures, \$237,838,000; tourist business, \$65,000,000; all minerals, \$67,339,000; 161 banks with total assets of \$358,079,875. (E. D. F.)

Colour Photography: see MOTION PICTURES; PHOTOGRAPHY: *Colour Photography*; NATIONAL GEOGRAPHIC SOCIETY.

Colour Printing: see PRINTING.

Colours: see FASHION AND DRESS.

Columbia, District of: see WASHINGTON, D.C.

Columbia University, in New York city, had in 1939-40 a registration of 32,211 resident students, including 11,822 in the summer session of 1939. The total number of officers of instruction and administration was 3,266. There were 69 university buildings on Morningside Heights. In 1938 the university capital endowment was \$86,980,474.61 and the total resources were \$158,868,638.04. The budget appropriation for 1938-39 was \$14,719,134.11. Tuition fees range from \$390 to \$500. Its main library, containing 1,662,883 volumes, is housed in a new building, the gift of Edward S. Harkness, and known at present as South Hall, opened in 1934. A number of special collections remain in the former library, now known as Low Memorial Library. The department of home study courses, Seth Low junior college in Brooklyn and New College, have been dis-

continued. New accommodations have been erected at the College of Physicians and Surgeons for the Crocker Cancer Research Laboratories, formerly at Amsterdam avenue and 116th street, and the vacated Crocker building has been turned into studios for drawing, painting and sculpture. (M. H. T.)

"Columbus": see EUROPEAN WAR: *The War at Sea*.

Colville, Sir Stanley (Cecil James) (1861-1939), British admiral, was born on February 21. He served in the Zulu war of 1879, the Egyptian campaign of 1882, the Nile expedition of 1884-85, and was severely wounded in the Dongola expedition of 1896, when Kitchener's forces recaptured the Anglo-Egyptian Sudan province from the Mahdists. Sir Stanley became a rear admiral in 1906. As vice admiral in command at the Shetland and Orkney islands at the outbreak of the World War, 1914-18, he directed the vital task of organizing the defences of the British fleet at Scapa Flow. He was appointed admiral in 1914, and from 1916 to 1919 he was commander-in-chief at Portsmouth. From 1912 to 1914 he had commanded the First Battle Squadron of the fleet. Sir Stanley, who was placed on the retired list in 1922, died at London on April 9.

Comiskey, John Louis (1885-1939), U.S. baseball executive, was born at Dubuque, Ia., on August 12, the son of Charles A. Comiskey, a one-time star player and manager who became owner of the Chicago White Sox team, which his son inherited in 1931. John Louis Comiskey in eight years became known as one of the most enterprising executives in baseball, and by a series of shrewd purchases and trades of players he made his team a consistent contender in the American League. He died at Eagle River, Wis., on July 18.

Commerce: see EXPORTS AND IMPORTS; INTERNATIONAL TRADE; SHIPPING, MERCHANT MARINE; TRADE AGREEMENTS.

Committee for Industrial Organization: see CONGRESS OF INDUSTRIAL ORGANIZATIONS.

Commodity Prices: see AGRICULTURE; PRICES.

Commons, Members of: see PARLIAMENT, HOUSES OF.

Commonwealth Fund, The. This fund, established by Mrs. Stephen V. Harkness in 1918 "to do something for the welfare of mankind," appropriated approximately \$1,900,000 in 1939. Of this total some two-thirds was devoted to the promotion and maintenance of physical health, nearly 10 per cent more to mental health. Public health activities, designed to raise standards of rural service, centred in Tennessee, Mississippi, Massachusetts, Oklahoma and Alabama. The tenth in a group of rural community hospitals built with aid from the Fund was opened in 1939; two more are under way. These hospitals stress opportunities for professional education as well as standards of medical, nursing and technical service. Fellowships were offered in 1939 to junior instructors in medical schools, without restriction as to field of study, as a means of encouraging able young investigators and strengthening teaching resources; continued aid was given to departments of preventive medicine and psychiatry, to extension teaching and other forms of post-graduate medical education, and to teaching arrangements designed to promote interplay between pediatrics and psychiatry. Appointments were made as usual to the Commonwealth Fund Fellowships for British graduate students at American universities: the war held some appointees at home. The Fund continued to subsidize medical research; aided child guidance enterprises in England; maintained an advisory service for community mental hygiene clinics

in the United States; made small grants for studies in administrative law and legal history; and published in 1939 eight books and pamphlets of educational significance in its fields of operation.

Communism, or revolutionary Marxism, is the system of government evolved under the leadership of Lenin and Stalin in the Soviet Union. Communism believes in the dictatorship of the proletariat for a transitional period, after which a free society would come into existence in which everybody would contribute to the common weal according to his capacities, and receive a reward according to his needs. This ultimate goal seems yet very far away in the Soviet Union; meanwhile the Soviet Union represents a dictatorship of the Communist Party with State ownership of all the important means of production. Communism proclaims the equality of all peoples and races and believes in the final establishment of an international order. Within this general frame Communist policy has undergone since 1920 several fundamental and sometimes sudden changes. One of these changes occurred during 1939 and impressed its stamp upon the policy of the Soviet Union as well as upon the Communist Parties outside the Soviet Union. During the past years the Soviet Union, and under its direction the Communist Parties in the whole world, pursued a policy of co-operation with the democratic nations and with liberal and progressive groups, both as regards foreign as well as domestic policy. This attitude aimed at the creation of a common front against the "fascist danger" represented especially in the anti-Comintern pact which bound Germany, Italy, Japan, and some smaller vassal countries into an alliance directed against the Soviet Union and against the spread of Communist influence. This alignment continued until Aug. 1939. Then the conclusion of the pact of non-aggression between the Soviet Union and National Socialist Germany announced a sudden and complete reversal. It found its expression in the new policy of the Soviet Union as well as in the attitude of the Communist Parties outside the Soviet Union.

The Soviet Union was primarily motivated in this step by her old distrust of the "capitalistic democracies." She may have hoped to stay thus out of war and to strengthen her position by the acquisition of important strategic territories without being involved in a major war, for which her army, her supply, and her transportation systems appeared in no way adequate. These expectations seemed at the beginning realized with the easy acquisition of eastern Poland and of naval, military, and air bases in the Baltic States. But the resistance of Finland changed the picture. It aroused public opinion in the world against the Soviet Union, and it drove the Soviet Union into closer co-operation with Germany. The Soviet Union now took her definite stand at the side of Fascist Germany which until 1939 had been regarded as the arch-enemy of peace, of the working class, and of Communism itself, and followed Fascist Germany in her attack against the western democracies and against the League of Nations. The Communist Parties outside the Soviet Union took up immediately and obediently the new policy. Their rigid dependence upon Moscow has been long responsible for their lack of vitality and of success. The new and sudden turn-face, which first threw the parties and the leaders into a state of complete confusion, weakened further their position outside the Soviet Union. They had now, practically overnight, to pursue a policy diametrically opposed to that which they had defended for the last five years. They broke up the Popular Front, the movement of co-operation with moderate social democrats and progressive liberals, and returned to the policy of violent attacks upon progressive liberalism, evolutionary socialism, and democracy. In these attacks they found themselves frequently in accord with National Socialist and Fascist propaganda. The position taken by the Soviet Union



EARL BROWDER, general secretary of the U.S. Communist Party, was jailed Oct. 23, 1939, after being indicted on charges of using a false American passport

and the Communist Party in the European war led to the dissolution of the Communist Party in France, the only remaining country where as the result of the former policy of the Popular Front the Communist Party had reached a certain numerical strength. In the other countries the Communist Party remained negligible in numbers and in practical influence. But the new attitude of the Soviet Union carried some confusion into the ranks of progressive liberals with regard to the character of the war which had broken out in Sept. 1939.

The new attitude of the Soviet Union and her rapprochement with Fascism had been prepared by several trends in recent Communism. The position of Stalin had undergone a profound transformation as compared with that of Lenin. Lenin had been the exponent of an objective idea, of a social evolution; Stalin became now a personal leader, endowed with individual creative capacities similar to Fascist leaders. Lenin had been the disciple of Marx; Stalin was now extolled above Marx and Lenin who were regarded as his forerunners; they had been theoreticians who prepared the ground; Stalin now became the man who had realized the program and who, through his personal leadership, had built up the Soviet Union. The old Communists and co-workers of Lenin had all been liquidated in the great purges from 1936 to 1938; a new generation which had grown up entirely under Stalin's regime and which was animated entirely by the vision of a Stalinist Soviet Union had completely replaced the older generation in administration and in economic executive positions. Not only the history of the Russian Revolution and of the Communist Party was being rewritten according to Stalinist conceptions, but the whole history of Russia was reinterpreted in a spirit entirely different from that prevailing under Lenin. A new Russian patriotism was fostered, the Russian political and cultural past glorified. Not only historiography, but also literature and the arts, especially the theatre and the movies, were put into the service of this new conception. The effect of these changes began to make itself felt in the policy inaugurated in 1939 by Communism. (See also DEMOCRACY; FASCISM; PACIFISM; SOCIALISM.)

(H. Ko.)

Communist Party.

Communist parties in both hemispheres felt the impact of the Nazi-Soviet non-aggression treaty of 1939 and the subsequent Russian invasion of Finland. Although the exact number of defections by party members is not known, it was undoubtedly considerable. In the United States several prominent members, including the former business manager of *The Daily Worker*, announced their resignations. Earl Browder, general secretary of the party, denied any mass withdrawals and declared on September 11 that "the Communist party has never been so firm . . . as it is today." In his appearance before the Dies committee in 1939 he claimed a membership of 100,000, of whom one-third resided in New York State. This figure was roundly disputed by others, who estimated the number at 50-60,000. In the presidential election of 1936, Communists polled 80,159 votes, a decrease of approximately 20,000 from the vote in the election of 1932. The budget of the U.S. Communist party is approximately \$250,000 annually. The national office is at 35 East 12th street, New York city. William Z. Foster is chairman of the party. Earl Browder was indicted Oct. 23, 1939 on charges of using a fraudulent U.S. passport and was sentenced Jan. 22, 1940 to four years' imprisonment. He was also fined \$2,000.

The French Communist party, whose leader is Maurice Thorez, fared badly after the start of the European war. It was dissolved Sept. 26, 1939 and many of its prominent leaders were jailed. Three days later the party (which claimed a membership of 280,000 in 1937) reorganized and adopted a new name—the French Workers and Peasants Group. British Communists were not seriously molested. Their membership is estimated at 10,000.



HOW THE TWO CHIEF "ISMS" attempted to influence American public opinion in 1939, according to Hutton of *The Philadelphia Inquirer*

Community Chest,

a term used to describe a local co-operative organization of citizens and social welfare agencies. It has two general functions: (1) to raise funds each year by a community-wide appeal for affiliated social welfare and health agencies and to distribute those funds by a budget procedure; and (2) to promote the social welfare and health of the community by co-ordinating services, improving standards, studying local problems, and developing better public understanding. Closely allied with the community chest is the Council of Social Agencies.

In 1939 there were 529 community chests, 513 of them in continental United States, one in the Virgin Islands, two in Hawaii, eleven in Canada and two in South Africa. All but six cities in the United States with more than 100,000 population have community chests. In 1939, 518 campaigns were reported, raising a total of approximately \$83,000,000. The 480 chests reporting campaign results for both 1938 and 1939 showed an average decrease of 3.1% for 1939 as compared with 1938.

The all-time peak for community chests was \$101,181,949, raised in 1932 when private agencies were trying to cope with unemployment relief and before Federal relief was under way. Subsequently chest funds declined somewhat until 1936. In that year the decline halted and chest funds increased until 1938, when they had reached 90.2% of the 1929 funds.

The history of the modern community chest movement is traced from 1913, when the Federation for Charity and Philanthropy was organized in Cleveland, Ohio.

Community Chests and Councils, Inc., 155 East 44th st., New York city, the national organization of community chests and councils of social agencies, was organized in 1918 as a clearing house for information for the 21 chests then organized. Today, 312 community chests and 16 councils of social agencies are affiliated with the organization on a voluntary membership basis. An advisory committee of local chest and council executives and a board of directors guide the organization policies. It is financed by dues from its corporate members.

An important activity of Community Chests and Councils, Inc., is administration of the annual Community Mobilization for Human Needs, which is sponsored by 36 co-operating national social agencies to give nation-wide backing to local campaigns. Charles P. Taft was chairman of the Mobilization from 1937 to 1940.

Officers for 1939 were George E. Vincent, honorary and acting president; John Stewart Bryan, Geoffrey E. Smith, vice-presidents; J. Herbert Case, treasurer; Pierce Atwater, secretary; Allen T. Burns is executive vice-president.

BIBLIOGRAPHY.—*Questions and Answers About Community Chests and Councils of Social Agencies*; *Yesterday and Today with Community Chests*; *Trends in Community Chest Giving*, published by Community Chests & Councils; *Articles on Community Chests and on Councils of Social Agencies in Social Work Year Book* published by Russell Sage Foundation.

(A. T. B.)

Community Trusts.

During the quarter century since the establishment of the first community trust—at Cleveland, Ohio, on Jan. 2, 1914—the philanthropic resources of 78 subsequently created community foundations rose to approximately \$50,000,000. Apart from several such trusts in Canada and one in Hawaii, their development has occurred principally in continental United States. Characteristically, they are charitable administrative agencies comprised of multiple funds from diverse sources and for varied purposes, with several fiduciary institutions supplying fiscal management to the funds and a central distributing committee supervising appropriations of expendible sums. Usually a portion, and frequently a majority, of the distributing committee is named by the incumbents of positions of public trust, such as the head of the Association of the

Bar or the Academy of Medicine, Federal judicial officials or those responsible for the authentication of wills. Each community foundation is, thus, a framework within which many charitable funds may be administered. Its distinctive procedure—subject to local variations—is ordinarily found in the circumstance that, though the distributing committee will undertake to give expression to the desires of a founder concerning the specific application of a fund established by him, discretionary power is vested in the committee to amend and adapt any such originally expressed desire if unforeseen changes in conditions make its literal execution impossible or impracticable.

The aggregate resources of community trusts reached \$25,000,000 in 1928, \$35,000,000 in 1930, and \$45,000,000 in 1935. Their combined appropriations in 1938 totalled \$1,700,000. The largest of these foundations, measured by capital held at the beginning of 1939, was the New York Community Trust with resources approximating \$8,600,000 followed by those in Chicago, Cleveland, Boston, Winnipeg, and Indianapolis.

With the probable diminution in the contemporary accumulation of large individual fortunes from which most of the great "personal" foundations of the present century sprung, it appears not unlikely that the numerous gifts of donors of more moderate means, reflected in the growth of these community trusts, may become an increasingly significant element of private philanthropy in the United States.

(R. Hs.)

Confectionery: *see* CANDY.

Conference of Commissioners on

Uniform State Laws.

The National Conference of Commissioners on Uniform State Laws is composed of commissioners, usually three in number, from each of the States and insular and territorial possessions of the United States. Its purposes are to promote uniformity in State laws and to draw model acts on subjects suitable for interstate compacts, and in which uniformity will make more effective the exercise of State powers and promote interstate co-operation.

The Conference was organized in 1890, has held 49 annual meetings and adopted 79 uniform acts, among which the best known are the Uniform Negotiable Instrument Act, adopted in 53 jurisdictions, the Warehouse Receipts Act, adopted in 48 jurisdictions, the Bill of Lading Act, Declaratory Judgment Act, Machine Gun Act, Narcotic Drug Act, Sales Act, and Stock Transfer Act. Every State has adopted one or more of its uniform acts and many States have accepted 25 or more.

Each draft of a proposed act is subjected to thorough analysis by the entire Conference, is then revised, resubmitted, and frequently rewritten again before final adoption. All acts are approved by the American Bar Association before promulgation.

Members serve without compensation. The Conference is supported by an allowance from the American Bar Association and by contributions from certain States and State and city bar associations.

(A. Ag.)

Congo, Belgian: *see* BELGIAN COLONIAL EMPIRE.

Congregational Church.

There are in the United States 6,096 churches with 1,043,276 members in the Congregational and Christian denomination. The records for 1938 show an increase of 12,362 in net membership of the churches and 6,431 in the church schools. This is the best record since 1925. These churches raised \$2,224,945 for benevolences and \$15,126,142 for the support of the local congregations,

showing increases in both of these items.

Because of the democratic nature of its organization, the denominational machinery is of the simplest sort. No State or national body has any authority over any local congregation, which is free to order its life to suit the needs of its people. At the same time, the churches maintain State and national agencies for mutual helpfulness. The State Conference office is a clearing house for the churches of the State and a central office for general church activity. In the nation the denomination has a central office, the General Council, at 287 Fourth avenue, New York, and also both home and foreign mission societies; the American Board of Commissioners for Foreign Missions, 14 Beacon street, Boston, and the Board of Home Missions, with which is affiliated the Council for Social Action, 287 Fourth avenue, New York.

During 1939, the New England churches damaged by the hurricane of Sept. 1938, were rebuilt and repaired, at a cost of more than \$2,000,000. Along with this necessary raising of funds for the work of local churches, benevolence giving for budgeted work and approved objects in 1938 show an increase of 16.9% over 1937.

The war in the Far East brought many serious problems to the American Board for Foreign Missions. Hospitals and schools in China have been damaged and orderly processes of life destroyed. But mission doctors have remained doing greatly increased service though seriously handicapped, and other missionaries and teachers have stayed by their work with the loyal support of the American churches. The European war did not affect mission work of the Congregational Church.

Abroad.—International Congregationalism maintains an international organization known as the International Council of Congregational Churches. This body meets once in ten years, and publishes a decennial volume on the life and work of the Congregational Churches around the world. Normally, the next meeting would have been held in Wellesley, Massachusetts, in 1940, but on account of war conditions it has been postponed until peace comes.

The principal regions in which Congregational Churches flourish, with the number of members, are as follows:

Congregational Churches (Abroad)

Africa	74,968	Madagascar	39,990
Australia and New Zealand	20,777	Near East	4,541
Brazil	6,349	Papua	6,666
China	33,070	Polynesia (excluding Hawaii and New Zealand).	24,831
Czecho-Slovakia	4,322	Philippines	6,410
England and Wales	419,561	Scotland	39,695
India and Ceylon	53,137	Sweden	110,569
Japan	32,860		

The International Moderator is the Rev. J. D. Jones of Bournemouth, England. The British office is at Memorial Hall, Farringdon st., London.

(F. L. F.)

Congressional Legislation: *see* LEGISLATION, FEDERAL; UNITED STATES.

Congress, United States.

The Seventy-sixth U. S. Congress met for its third session on Jan. 3, 1940. It comprised the following list of members:

United States Senate (*re-elected in 1938)

Presiding Officer: John N. Garner, Vice-President
Majority Leader: Alben W. Barkley, of Kentucky
Minority Leader: Charles L. McNary, of Oregon

State	Name	Party	Term Expires	Residence
Ala.	Bankhead, John H.	Dem.	1943	Jasper
	Hill, Lister	Dem.	1945	Montgomery
Ariz.	Ashurst, Henry F.	Dem.	1941	Prescott
	*Hayden, Carl	Dem.	1945	Phoenix

				Majority Leader: Sam Rayburn, of Texas						
State	Name	Party	Term Expires	Residence	Minority Leader: Joseph W. Martin, Jr., of Massachusetts					
					State	Dist.	Name	Party	Residence	
Ark.	*Caraway, Mrs. Hattie W.	Dem.	1945	Jonesboro	Ala.	1	*Boykin, Frank W.	Dem.	Mobile	
	Miller, John E.	Dem.	1943	Searcy		2	*Grant, George M.	Dem.	Troy	
Calif.	Johnson, Hiram W.	Rep.	1941	San Francisco		3	*Steagall, Henry B.	Dem.	Ozark	
Colo.	Downey, Sheridan	Dem.	1945	Atherton	4	*Hobbs, Sam	Dem.	Selma		
	*Adams, Alva B.	Dem.	1945	Pueblo	5	*Starnes, Joe	Dem.	Guntersville		
	Johnson, Edwin C.	Dem.	1941	Denver	6	*Jarman, Pete	Dem.	Livingston		
Conn.	Danaher, John A.	Rep.	1945	Hartford	7	*Bankhead, William B.	Dem.	Jasper		
	Maloney, Francis T.	Dem.	1941	Meriden	8	*Sparkman, John J.	Dem.	Huntsville		
Del.	Townsend, John G., Jr.	Rep.	1941	Selbyville	9	*Patrick, Luther	Dem.	Birmingham		
	Hughes, James H.	Dem.	1943	Dover	Ariz.					
Fla.	*Pepper, Claude	Dem.	1945	Tallahassee						
	Andrews, Charles O.	Dem.	1941	Orlando						
Ga.	*George, Walter F.	Dem.	1945	Vienna	Ark.	1	*Murdock, John R.	Dem.	Tempe	
	Russell, Richard B., Jr.	Dem.	1943	Winder		2	Gathings, E. C.	Dem.	West Memphis	
Ida.	Borah, Wm. E. (died Jan. 19, 1940)	Rep.	1943	Boise		3	Mills, Wilbur D.	Dem.	Kennett	
	Clark, D. Worth	Dem.	1945	Pocatello	4	Ellis, Clyde T.	Dem.	Bentonville		
Ill.	Slattery, James M.	Dem.	1943	Chicago	5	Cravens, Fadio	Dem.	Fort Smith		
	Lucas, Scott W.	Dem.	1945	Havana	6	*Terry, David D.	Dem.	Little Rock		
Ind.	*Van Nuys, Frederick	Dem.	1945	Indianapolis	7	Norrell, W. F.	Dem.	Monticello		
	Minton, Sherman	Dem.	1941	New Albany	Calif	1	*Kitchens, Wade H.	Dem.	Magnolia	
Iowa	*Gillette, Guy M.	Dem.	1945	Cherokee		2	*Lea, Clarence F.	Dem.	Santa Rosa	
	Herring, Clyde La V.	Dem.	1943	Des Moines		3	*Englebright, Harry L.	Rep.	Nevada City	
Kan.	Capper, Arthur	Rep.	1943	Topeka	4	*Buck, Frank H.	Dem.	Vacaville		
	Reed, Clyde M.	Rep.	1945	Parsons	5	*Havenner, Franck R.	Dem.	San Francisco		
Ky.	*Barkley, Alben W.	Dem.	1945	Paducah	6	*Welch, Richard J.	Rep.	San Francisco		
	Chandler, A. B.	Dem.	1943	Versailles	7	*Carter, Albert E.	Rep.	Oakland		
La.	*Overton, John H.	Dem.	1945	Alexandria	8	*Tolan, John H.	Dem.	Oakland		
	Ellender, Allen J.	Dem.	1943	Houma	9	Anderson, John Z.	Rep.	San Juan Bautista		
Me.	Hale, Frederick	Rep.	1941	Portland	10	*Gearhart, Bertrand W.	Rep.	Fresno		
	White, Wallace H., Jr.	Rep.	1943	Auburn	11	*Elliott, Albert J.	Dem.	Tulare		
Md.	*Tydings, Millard E.	Dem.	1945	Havre de Grace	12	Hinshaw, Carl	Rep.	Pasadena		
	Radcliffe, George L.	Dem.	1941	Baltimore	13	*Voorhis, Jerry	Dem.	San Dimas		
Mass.	Walsh, David I.	Dem.	1941	Clinton	14	*Kramer, Charles	Dem.	Los Angeles		
	Lodge, Henry C., Jr.	Rep.	1943	Beverly	15	*Ford, Thomas F.	Dem.	Los Angeles		
Mich.	Vandenberg, Arthur H.	Rep.	1941	Grand Rapids	16	*Costello, John M.	Dem.	Hollywood		
	Brown, Prentiss M.	Dem.	1943	St. Ignace	17	Ford, Leland M.	Rep.	Santa Monica		
Minn.	Shipstead, Henrik	F.L.	1941	Miltna	18	Geyer, Lee E.	Dem.	Gardena		
	Lundeen, Ernest	F.L.	1943	Minneapolis	19	Vacant				
Miss.	Harrison, Pat	Dem.	1943	Gulfport	20	*Sheppard, Harry R.	Dem.	Yucaipa		
	Bilbo, Theodore G.	Dem.	1941	Poplarville	Colo.	1	*Izac, Edouard V. M.	Dem.	San Diego	
Mo.	*Clark, Bennett C.	Dem.	1945	St. Louis		2	*Lewis, Lawrence	Dem.	Denver	
	Truman, Harry S.	Dem.	1941	Independence		3	*Cummings, Fred	Dem.	Fort Collins	
Mont.	Wheeler, Burton K.	Dem.	1941	Butte	4	Vacant				
	Murray, James E.	Dem.	1943	Butte	Conn.					
Neb.	Norris, George W.	Ind.	1943	McCook						
	Burke, Edward R.	Dem.	1941	Omaha		1	*Taylor, Edward T.	Dem.	Glenwood Springs	
Nev.	Pittman, Key	Dem.	1941	Tonopah	2	Monkiewicz, B. J.	Rep.	New Britain		
	*McCarran, Patrick A.	Dem.	1945	Reno	3	Miller, William J.	Rep.	Wethersfield		
N.H.	Tobey, Charles W.	Rep.	1945	Temple	4	Ball, Thomas R.	Rep.	Old Lyme		
	Bridges, H. Styles	Rep.	1943	Concord	5	*Shanley, James A.	Dem.	New Haven		
N.J.	Smathers, William H.	Dem.	1943	Margate	6	Austin, Albert E.	Rep.	Old Greenwich		
	Barbour, W. Warren	Rep.	1941	Locust	7	*Smith, J. Joseph	Dem.	Waterbury		
N.M.	Hatch, Carl A.	Dem.	1943	Clovis	8	Williams, George S.	Rep.	Millsboro		
	Chavez, Dennis	Dem.	1941	Albuquerque	Del.	1	*Peterson, J. Hardin	Dem.	Lakeland	
N.Y.	Mead, James M.	Dem.	1941	Buffalo		2	*Green, Lex	Dem.	Starke	
	*Wagner, Robert F.	Dem.	1945	New York City		3	*Caldwell, Millard F.	Dem.	Milton	
N.C.	Bailey, Josiah W.	Dem.	1943	Raleigh	4	Cannon, Pat.	Dem.	Miami		
	*Reynolds, Robert R.	Dem.	1945	Asheville	5	*Hendricks, Joe	Dem.	De Land		
N.D.	Frazier, Lynn J.	Rep.	1941	Hoople	Ga.	1	*Peterson, Hugh	Dem.	Ailey	
	*Nye, Gerald P.	Rep.	1945	Cooperstown		2	*Cox, Edward E.	Dem.	Camilla	
Ohio	Taft, Robert A.	Rep.	1945	Cincinnati		3	*Pace, Stephen	Dem.	Americus	
	Donahay, Vic	Dem.	1941	Huntsville	4	Camp, Albert S.	Dem.	Newnan		
Okla.	*Thomas, Elmer	Dem.	1945	Medicine Park	5	*Ramspeck, Robert	Dem.	Atlanta		
	Lee, Josh	Dem.	1943	Norman	6	*Vinson, Carl	Dem.	Milledgeville		
Ore.	McNary, Charles L.	Rep.	1943	Salem	7	*Tarver, Malcolm C.	Dem.	Dalton		
	Holman, Rufus C.	Rep.	1945	Portland	8	Gibbs, W. Ben.	Dem.	Jesup		
Pa.	*Davis, James J.	Rep.	1945	Pittsburgh	9	*Whelchel, B. Frank	Dem.	Gainesville		
	Guffey, Joseph F.	Dem.	1941	Pittsburgh	10	*Brown, Paul	Dem.	Elberton		
R.I.	Gerry, Peter G.	Dem.	1941	Warwick	Ida.	1	*White, Compton I.	Dem.	Clark Fork	
	Green, Theodore F.	Dem.	1943	Providence		2	Dworshak, Henry C.	Rep.	Burley	
S.C.	*Smith, Ellison DuB.	Dem.	1945	Lynchburg		3	Smith, T. V.	Dem.	Chicago	
	Byrnes, James F.	Dem.	1943	Spartanburg	Ill.	1	Martin, John C.	Dem.	Salem	
S.D.	Bulow, William J.	Dem.	1943	Beresford		2	*Mitchell, Arthur W.	Dem.	Chicago	
	Gurney Chan	Rep.	1945	Yankton		3	*McKeough, Raymond S.	Dem.	Chicago	
Tenn.	McKellar, Kenneth	Dem.	1941	Memphis	4	*Kelly, Edward A.	Dem.	Chicago		
	Stewart, Tom	Dem.	1943	Winchester	5	*Beam, Harry P.	Dem.	Chicago		
Tex.	Sheppard, Morris	Dem.	1943	Texarkana	6	*Sabath, Adolph J.	Dem.	Chicago		
	Connally, Tom	Dem.	1941	Marlin	7	Maciejewski, A. F.	Dem.	Cicero		
Utah	King, William H.	Dem.	1941	Salt Lake City	8	*Schuetz, Leonard W.	Dem.	Chicago		
	*Thomas, Elbert D.	Dem.	1945	Salt Lake City	9	*Kocialkowski, Leo	Dem.	Chicago		
Vt.	Austin, Warren R.	Rep.	1941	Burlington	10	*McAndrews, James	Dem.	Chicago		
	*Gibson, Ernest W.	Rep.	1945	Brattleboro	11	*Church, Ralph E.	Rep.	Evanston		
Va.	Glass, Carter	Dem.	1943	Lynchburg	12	*Reed, Chauncey W.	Rep.	West Chicago		
	Byrd, Harry F.	Dem.	1941	Berryville	13	*Mason, Noah M.	Rep.	Oglesby		
Wash.	*Bone, Homer T.	Dem.	1945	Tacoma	14	*Allen, Leo E.	Rep.	Galena		
	Schwellenbach, Lewis B.	Dem.	1941	Neppel	15	Johnson, Anton J.	Rep.	Macomb		
W.Va.	Neely, Matthew M.	Dem.	1943	Fairmont	16	Chipperfield, Robert B.	Rep.	Canton		
	Holt, Rush D.	Dem.	1941	Weston	17	*Dirksen, Everett McK.	Rep.	Pekin		
Wis.	LaFollette, Robert M., Jr.	Pro.	1941	Madison	18	*Arends, Leslie C.	Rep.	Melvin		
	Wiley, Alexander	Rep.	1945	Chippewa Falls	19	Sumner, Jessie	Rep.	Milford		
Wyo.	O'Mahoney, Joseph C.	Dem.	1941	Cheyenne	20	Wheat, William H.	Rep.	Rantoul		
	Schwartz, Harry H.	Dem.	1943	Casper	21	Barnes, James M.	Dem.	Jacksonville		
United States House of Representatives (*served in 75th Congress)					22	*Fries, Frank W.	Dem.	Carlinville		
					23	*Schaefer, Edwin M.	Dem.	Belleville		
					24	*Arnold, Laurence F.	Dem.	Newton		
					25	*Parsons, Claude V.	Dem.	Golconda		
					26	*Keller, Kent E.	Dem.	Ava		
Speaker: William B. Bankhead, of Alabama					27	*Schulte, William T.	Dem.	Hammond		
					28	*Halleck, Charles A.	Rep.	Rensselaer		
					29	Grant, Robert A.	Rep.	South Bend		

CONGRESS, UNITED STATES

State	Dist.	Name	Party	Residence	State	Dist.	Name	Party	Residence
Ind.	4	Gillie, George W.	Rep.	Fort Wayne	Miss.	7	*McGehee, Dan R.	Dem.	Meadville
	5	Harness, Forest A.	Rep.	Kokomo	Mo.	1	*Romjue, Milton A.	Dem.	Macon
	6	Johnson, Noble J.	Rep.	Terre Haute		2	*Nelson, William L.	Dem.	Columbia
	7	Landis, Gerald W.	Rep.	Linton		3	*Duncan, Richard M.	Dem.	St. Joseph
	8	*Boehne, John W., Jr.	Dem.	Evansville		4	*Bell, C. Jasper	Dem.	Blue Springs
	9	*Crowe, Eugene B.	Dem.	Bedford		5	*Shannon, Joseph B.	Dem.	Kansas City
	10	Springer, Raymond S.	Rep.	Connersville		6	*Wood, Reuben T.	Dem.	Springfield
	11	*Larrabee, William H.	Dem.	New Palestine		7	*Short, Dewey	Rep.	Galena
	12	*Ludlow, Louis	Dem.	Indianapolis		8	*Williams, Clyde	Dem.	Hillsboro
Iowa	1	*Martin, Thomas E.	Rep.	Iowa City		9	*Cannon, Clarence	Dem.	Elsberry
	2	*Jacobsen, William S.	Dem.	Clinton		10	*Zimmerman, Orville	Dem.	Kennett
	3	*Gwynne, John W.	Rep.	Waterloo		11	*Hennings, Thomas C., Jr.	Dem.	St. Louis
	4	Talle, Henry O.	Rep.	Decorah		12	*Anderson, C. Arthur	Dem.	Lemay
	5	Le Compte, Karl M.	Rep.	Corydon		13	*Cochran, John J.	Dem.	St. Louis
	6	*Dowell, Cassius C.	Rep.	Des Moines	Mont.	1	Thorkelson, J.	Rep.	Butte
	7	Jensen, Ben F.	Rep.	Exira		2	*O'Connor, James F.	Dem.	Livingston
	8	*Gilchrist, Fred C.	Rep.	Laurens	Neb.	1	<i>Vacant</i>		
	9	*Harrington, Vincent F.	Dem.	Sioux City		2	*McLaughlin, Charles F.	Dem.	Omaha
Kan.	1	*Lambertson, William P.	Rep.	Fairview		3	*Stefan, Karl	Rep.	Norfolk
	2	*Guyer, Ulysses S.	Rep.	Kansas City		4	Curtis, Carl T.	Rep.	Minden
	3	Winter, Thomas D.	Rep.	Girard		5	*Coffee, Harry B.	Dem.	Chadron
	4	*Rees, Edward H.	Rep.	Emporia	Nev.		*Scrugham, James G.	Dem.	Reno
	5	*Houston, John M.	Dem.	Newton	N.H.	1	Jenks, Arthur B.	Rep.	Manchester
	6	*Carson, Frank	Rep.	Concordia		2	Stearns, Foster	Rep.	Hancock
	7	*Hope, Clifford R.	Rep.	Garden City	N.J.	1	*Wolverton, Charles A.	Rep.	Merchantville
Ky.	1	*Gregory, Noble J.	Dem.	Mayfield		2	Jeffries, Walter S.	Rep.	Margate City
	2	*Vincent, Beverly M.	Dem.	Brownville		3	*Sutphin, William H.	Dem.	Matawan
	3	*O'Neal, Emmet	Dem.	Louisville		4	*Powers, D. Lane	Rep.	Trenton
	4	*Creal, Edward W.	Dem.	Hodgenville		5	*Eaton, Charles A.	Rep.	Watchung
	5	*Spence, Brent	Dem.	Fort Thomas		6	*McLean, Donald H.	Rep.	Elizabeth
	6	*Chapman, Virgil	Dem.	Paris		7	*Thomas, J. Parnell	Rep.	Allendale
	7	*May, Andrew J.	Dem.	Prestonsburg		8	*Seger, George N.	Rep.	Passaic
	8	*Bates, Joe B.	Dem.	Greenup		9	Osmer, Frank C., Jr.	Rep.	Haworth
	9	*Robson, John M.	Rep.	Barbourville		10	*Hartley, Fred A., Jr.	Rep.	Kearny
La.	1	*Fernandez, Joachim O.	Dem.	New Orleans		11	Vreeland, Albert L.	Rep.	East Orange
	2	*Maloney, Paul H.	Dem.	New Orleans		12	Kean, Robert W.	Rep.	Livingston
	3	*Mouton, Robert L.	Dem.	Lafayette		13	*Norton, Mrs. Mary T.	Dem.	Jersey City
	4	*Brooks, Overton	Dem.	Shreveport		14	*Hart, Edward J.	Dem.	Jersey City
	5	*Mills, Newt V.	Dem.	Mer Rouge	N.M.		*Dempsey, John J.	Dem.	Santa Fe
	6	*Griffith, John K.	Dem.	Slidell	N.Y.		*Merritt, Matthew J.	Dem.	Flushing
	7	*DeRouen, René L.	Dem.	Ville Platte			*O'Day, Mrs. Caroline	Dem.	Rye
	8	*Allen, A. Leonard	Dem.	Winnfield		1	Hall, Leonard W.	Rep.	Oyster Bay
Me.	1	*Oliver, James C.	Rep.	South Portland		2	*Barry, William B.	Dem.	Hollis
	2	*Smith, Clyde H.	Rep.	Skowhegan		3	*Pfeifer, Joseph L.	Dem.	Brooklyn
	3	*Brewster, Ralph O.	Rep.	Dexter		4	*Cullen, Thomas H.	Dem.	Brooklyn
Md.	1	Ward, David J.	Dem.	Salisbury		5	*Evans, Marcellus H.	Dem.	Brooklyn
	2	*Cole, William P., Jr.	Dem.	Towson		6	*Somers, Andrew L.	Dem.	Brooklyn
	3	D'Alesandro, Thomas, Jr.	Dem.	Baltimore		7	*Delaney, John J.	Dem.	Brooklyn
	4	*Kennedy, Ambrose J.	Dem.	Baltimore		8	*O'Toole, Donald L.	Dem.	Brooklyn
	5	Sasscer, Lansdale G.	Dem.	Upper Marlboro		9	*Keogh, Eugene J.	Dem.	Brooklyn
	6	Bryon, William D.	Dem.	Williamsport		10	*Celler, Emanuel	Dem.	Brooklyn
Mass.	1	*Treadway, Allen T.	Rep.	Stockbridge		11	*O'Leary, James A.	Dem.	W. New Brighton
	2	*Clason, Charles R.	Rep.	Springfield		12	*Dickstein, Samuel	Dem.	New York City
	3	*Casey, Joseph E.	Dem.	Clinton		13	*Sullivan, Christopher D.	Dem.	New York City
	4	*Holmes, Pehr G.	Rep.	Worcester		14	<i>Vacant</i>		
	5	*Rogers, Mrs. Edith N.	Rep.	Lowell		15	Kennedy, Michael J.	Dem.	New York City
	6	*Bates, George J.	Rep.	Salem		16	Fay, James H.	Dem.	New York City
	7	*Connery, Lawrence J.	Dem.	Lynn		17	*Barton, Bruce	Rep.	New York City
	8	*Healey, Arthur D.	Dem.	Somerville		18	*Kennedy, Martin J.	Dem.	New York City
	9	*Luce, Robert	Rep.	Waltham		19	*Bloom, Sol	Dem.	New York City
	10	*Tinkham, George H.	Rep.	Boston		20	Marcantonio, Vito	Am.Lab.	New York City
	11	*Flaherty, Thomas A.	Dem.	Boston		21	*Gavagan, Joseph A.	Dem.	New York City
	12	*McCormack, John W.	Dem.	Boston		22	*Curley, E. W. (died Jan. 7, 1940)	Dem.	Bronx
	13	*Wigglesworth, Richard B.	Rep.	Milton		23	*Buckley, Charles A.	Dem.	Bronx
	14	*Martin, Joseph W., Jr.	Rep.	North Attleboro		24	*Fitzpatrick, James M.	Dem.	Bronx
	15	*Gifford, Charles L.	Rep.	Barnstable		25	*Gamble, Ralph A.	Rep.	Larchmont
Mich.	1	Tenerowicz, Rudolph G.	Dem.	Hamtramck		26	*Fish, Hamilton	Rep.	Garrison
	2	*Michener, Earl C.	Rep.	Adrian		27	*Rockefeller, Lewis K.	Rep.	Chatham
	3	*Shafer, Paul W.	Rep.	Battle Creek		28	*Byrne, William T.	Dem.	Loudonville
	4	*Hoffman, Clare E.	Rep.	Allegan		29	*Cluett, E. Harold	Rep.	Troy
	5	<i>Vacant</i>				30	*Crowther, Frank	Rep.	Schenectady
	6	Blackney, William W.	Rep.	Flint		31	<i>Vacant</i>		
	7	*Wolcott, Jesse P.	Rep.	Port Huron		32	*Culkin, Francis D.	Rep.	Oswego
	8	*Crawford, Fred L.	Rep.	Saginaw		33	*Douglas, Fred J.	Rep.	Utica
	9	*Engel, Albert J.	Rep.	Lake City		34	Hall, Edwin A.	Rep.	Binghamton
	10	*Woodruff, Roy O.	Rep.	Bay City		35	*Hancock, Clarence E.	Rep.	Syracuse
	11	Bradley, Fred	Rep.	Rogers City		36	*Taber, John	Rep.	Auburn
	12	*Hook, Frank E.	Dem.	Ironwood		37	*Cole, W. Sterling	Rep.	Bath
	13	McLeod, Clarence J.	Rep.	Detroit		38	O'Brien, Joseph J.	Rep.	East Rochester
	14	*Rabaut, Louis C.	Dem.	Grosse Pointe Park		39	*Wadsworth, James W.	Rep.	Geneseo
	15	*Dingell, John D.	Dem.	Detroit		40	*Andrews, Walter G.	Rep.	Buffalo
	16	*Lesinski, John	Dem.	Dearborn		41	Harter, J. Francis	Rep.	Eggersville
	17	*Dondero, George A.	Rep.	Royal Oak		42	Schwert, Pius L.	Dem.	Buffalo
Minn.	1	*Andresen, August H.	Rep.	Red Wing		43	*Reed, Daniel A.	Rep.	Dunkirk
	2	*Ryan, Elmer J.	Dem.	South St. Paul	N.C.	1	*Warren, Lindsay C.	Dem.	Washington
	3	Alexander, John G.	Rep.	Minneapolis		2	*Kerr, John H.	Dem.	Warrenton
	4	*Maas, Melvin J.	Rep.	St. Paul		3	*Barden, Graham A.	Dem.	New Bern
	5	Youngdahl, Oscar	Rep.	Minneapolis		4	*Cooley, Harold D.	Dem.	Nashville
	6	*Knutson, Harold	Rep.	St. Cloud		5	Folger, Alonzo D.	Dem.	Mount Airy
	7	Andersen, H. Carl	Rep.	Tyler		6	Durham, Carl T.	Dem.	Chapel Hill
	8	Pittenger, William A.	Rep.	Duluth		7	*Clark, J. Bayard	Dem.	Fayetteville
	9	*Buckler, Richard T.	F.L.	Crookston		8	Burgin, William O.	Dem.	Lexington
Miss	1	*Rankin, John E.	Dem.	Tupelo		9	*Doughton, Robert L.	Dem.	Laurel Springs
	2	*Doxey, Wall	Dem.	Holly Springs		10	*Bulwinkle, Alfred I.	Dem.	Gastonia
	3	*Whittington, William M.	Dem.	Greenwood		11	*Weaver, Zebulon	Dem.	Asheville
	4	*Ford, Aaron L.	Dem.	Ackerman	N.D.		*Burdick, Usher L.	Rep.	Williston
	5	*Collins, Ross A.	Dem.	Meridian			*Lemke, William	Rep.	Fargo
	6	Colmer, William M.	Dem.	Pascagoula	Ohio		Bender, George H.	Rep.	Cleveland Heights

State	Dist.	Name	Party	Residence	State	Dist.	Name	Party	Residence
Ohio		Marshall, L. L.	Rep.	Euclid	Tex.	11	*Poage, William R.	Dem.	Waco
	1	Elston, Charles H.	Rep.	Newtown		12	*Lanham, Fritz G.	Dem.	Fort Worth
	2	Hess, William E.	Rep.	Cincinnati		13	Gossett, Ed.	Dem.	Wichita Falls
	3	Routzohn, Harry N.	Rep.	Dayton		14	*Kleberg, Richard M.	Dem.	Corpus Christi
	4	Jones, Robert F.	Rep.	Lima		15	*West, Milton H.	Dem.	Brownsville
	5	Clevenger, Cliff	Rep.	Bryan		16	*Thomason, R. Ewing	Dem.	El Paso
	6	*Polk, James G.	Dem.	Highland		17	*Garrett, Clyde L.	Dem.	Eastland
	7	Brown, Clarence J.	Rep.	Blanchester		18	*Jones, Marvin	Dem.	Amarillo
	8	Smith, Frederick C.	Rep.	Marion		19	*Mahon, George H.	Dem.	Colorado
	9	*Hunter, John F.	Dem.	Toledo		20	Kilday, Paul J.	Dem.	San Antonio
	10	*Jenkins, Thomas A.	Rep.	Ironton		21	*South, Charles L.	Dem.	Coleman
	11	*Claypool, Harold K.	Dem.	Chillicothe	Utah	1	*Murdock, Abe	Dem.	Beaver
	12	Vorys, John M.	Rep.	Columbus		2	*Robinson, J. Will	Dem.	Provo
	13	*White, Dudley A.	Rep.	Norwalk	Vt.		*Plumley, Charles A.	Rep.	Northfield
	14	*Harter, Dow W.	Dem.	Akron	Va.	1	*Bland, Schuyler O.	Dem.	Newport News
	15	*Secrest, Robert T.	Dem.	Caldwell		2	Darden, Colgate W., Jr.	Dem.	Norfolk
	16	Seccombe, James.	Rep.	Canton		3	*Satterfield, Dave E.	Dem.	Richmond
	17	<i>Vacant</i>				4	*Drewry, Patrick H.	Dem.	Petersburg
	18	Lewis, Earl R.	Rep.	St. Clairsville		5	*Burch, Thomas G.	Dem.	Martinsville
	19	*Kirwan, Michael J.	Dem.	Youngstown		6	*Woodrum, Clifton A.	Dem.	Roanoke
	20	*Sweeney, Martin L.	Dem.	Cleveland		7	*Robertson, A. Willis	Dem.	Lexington
	21	*Crosser, Robert	Dem.	Cleveland		8	*Smith, Howard W.	Dem.	Alexandria
	22	<i>Vacant</i>				9	*Flannagan, John W., Jr.	Dem.	Bristol
Okla.		*Rogers, Will	Dem.	Oklahoma City	Wash.	1	*Magnuson, Warren G.	Dem.	Seattle
	1	*Disney, Wesley E.	Dem.	Tulsa		2	*Wallgren, Monard C.	Dem.	Everett
	2	*Nichols, Jack	Dem.	Eufaula		3	*Smith, Martin F.	Dem.	Hoquiam
	3	*Cartwright, Wilburn	Dem.	McAlester		4	*Hill, Knute	Dem.	Prosser
	4	*Boren, Lyle H.	Dem.	Seminole		5	*Leavy, Charles H.	Dem.	Spokane
	5	*Monrone, Mike	Dem.	Oklahoma City		6	*Coffee, John M.	Dem.	Tacoma
	6	*Johnson, Jed	Dem.	Anadarko	W.Va.	1	Schiffler, Andrew C.	Rep.	Wheeling
	7	*Massingale, Sam C.	Dem.	Cordell		2	*Randolph, Jennings	Dem.	Elkins
	8	*Ferguson, Phil	Dem.	Woodward		3	*Edmiston, Andrew	Dem.	Weston
Ore	1	*Mott, James W.	Rep.	Salem		4	*Johnson, George W.	Dem.	Parkersburg
	2	*Pierce, Walter M.	Dem.	La Grande		5	*Kee, John	Dem.	Bluefield
	3	Angell, Homer D.	Rep.	Portland		6	*Smith, Joe L.	Dem.	Beckley
Pa.	1	*Sacks, Leon	Dem.	Philadelphia	Wis.	1	Bolles, Stephen	Rep.	Janesville
	2	*McGranery, James P.	Dem.	Philadelphia		2	Hawks, Charles, Jr.	Rep.	Horicon
	3	*Bradley, Michael J.	Dem.	Philadelphia		3	<i>Vacant</i>		
	4	Sheridan, John	Dem.	Philadelphia		4	Schafer, John C.	Rep.	Milwaukee
	5	Gartner, Fred C.	Rep.	Philadelphia		5	Thill, Lewis D.	Rep.	Milwaukee
	6	Myers, Francis J.	Dem.	Philadelphia		6	Keefe, Frank B.	Rep.	Oshkosh
	7	Darrow, George P.	Rep.	Philadelphia		7	Murray, Reid F.	Rep.	Waupaca
	8	*Wolfenden, James	Rep.	Upper Darby		8	Johns, Joshua L.	Rep.	Algoma
	9	Gerlach, Charles L.	Rep.	Allentown		9	*Hull, Merlin	Pro.	Black River Falls
	10	*Kinzer, J. Roland	Rep.	Lancaster		10	*Gehrmann, Bernard J.	Pro.	Mellen
	11	*Boland, Patrick J.	Dem.	Scranton	Wyo.		Horton, Frank O.	Rep.	Saddlestring
	12	*Flannery, J. Harold	Dem.	Pittston					
	13	Fenton, Ivor D.	Rep.	Mahanoy City					
	14	*Moser, Guy L.	Dem.	Douglasville					
	15	*Rutherford, Albert G.	Rep.	Honesdale					
	16	*Rich, Robert F.	Rep.	Woodrich					
	17	*Ditter, J. William	Rep.	Ambler					
	18	*Simpson, Richard M.	Rep.	Huntingdon					
	19	Kunkel, John C.	Rep.	Harrisburg					
	20	*Jarrett, Benjamin	Rep.	Farrell					
	21	*Walter, Francis E.	Dem.	Easton					
	22	Gross, Chester H.	Rep.	Manchester					
	23	Van Zandt, James E.	Rep.	Altoona					
	24	*Snyder, J. Buell	Dem.	Perryopolis					
	25	*Faddis, Charles I.	Dem.	Waynesburg					
	26	Graham, Louis E.	Rep.	Beaver					
	27	Tibbott, Harve	Rep.	Ebensburg					
	28	*Allen, Robert G.	Dem.	Greensburg					
	29	Rodgers, Robert L.	Rep.	Erie					
	30	Corbett, Robert J.	Rep.	Bellevue					
	31	McDowell, John	Rep.	Wilksburg					
	32	*Eberharter, Herman P.	Dem.	Pittsburgh					
	33	McArdle, Joseph A.	Dem.	Pittsburgh					
	34	*Dunn, Matthew A.	Dem.	Mount Oliver					
R.I.	1	Risk, Charles F.	Rep.	Saylesville					
S.C.	2	Sandager, Harry	Rep.	Cranston					
	1	McMillan, Clara G.	Dem.	Charleston					
	2	*Fulmer, Hampton P.	Dem.	Orangeburg					
	3	Hare, Butler B.	Dem.	Saluda					
	4	Bryson, Joseph R.	Dem.	Greenville					
	5	*Richards, James P.	Dem.	Lancaster					
	6	McMillan, John L.	Dem.	Florence					
S.D.	1	Mundt, Karl E.	Rep.	Madison					
	2	*Case, Francis H.	Rep.	Custer					
Tenn.	1	*Reece, B. Carroll	Rep.	Johnson City					
	2	Jennings, John, Jr.	Rep.	Knoxville					
	3	Kefauver, Estes	Dem.	Chattanooga					
	4	Gore, Albert	Dem.	Carthage					
	5	Byrns, Joseph W., Jr.	Dem.	Nashville					
	6	Courtney, Wirt	Dem.	Franklin					
	7	*Pearson, Herron	Dem.	Jackson					
	8	*Cooper, Jere	Dem.	Dyersburg					
	9	<i>Vacant</i>							
Tex.	1	*Patman, Wright	Dem.	Texarkana					
	2	*Dies, Martin	Dem.	Orange					
	3	Beckworth, Lindley	Dem.	Gilmer					
	4	*Rayburn, Sam	Dem.	Bonham					
	5	*Sumners, Hatton W.	Dem.	Dallas					
	6	*Johnson, Luther A.	Dem.	Corsicana					
	7	*Patton, Nat	Dem.	Crockett					
	8	*Thomas, Albert	Dem.	Houston					
	9	*Mansfield, Joseph J.	Dem.	Columbus					
	10	*Johnson, Lyndon	Dem.	Austin					

Congress of Industrial Organizations,

a federation of labour unions in the United States and Canada, of which John L. Lewis, president of the United Mine Workers, is president.

Formed on Nov. 9, 1935, as the Committee for Industrial Organization, the committee held its first constitutional convention in Pittsburgh on Nov. 14-18, 1938, changed its name, adopted a constitution, named Mr. Lewis president, Philip Murray and Sidney Hillman vice-presidents, and James E. Carey secretary. At the 1939 convention four additional vice-presidents were named.

The C.I.O. was formed by representatives of eight international unions affiliated with the American Federation of Labor to promote the development of industrial unions within the American Federation of Labor. They announced their purpose to encourage and promote organization of workers in the mass-production and unorganized industries of the nation.

The 1939 convention reported 45 national and international unions. The reported membership was (1938) 3,787,000.

The first objective of the C.I.O. was to organize the employees in the mass-production industries, such as steel, automobiles and textiles, into industrial unions. In 1938 the C.I.O. reported the membership of the Amalgamated Association of Iron, Steel, and Tin Workers had grown from approximately 10,000 to more than 525,000; the United Automobile Workers from 30,000 to 381,000, and the textile union from 25,000 to 450,000. In 1939 the C.I.O. ventured into new fields, notably the building construction field which had hitherto been the monopoly of the A.F. of L. (See also AMERICAN FEDERATION OF LABOR; CALIFORNIA: History; LABOUR UNIONS; STRIKES AND LOCK-OUTS; UNITED STATES.) (L. STA.)

Connecticut, one of the original States of the United States, popularly known as the "Nutmeg State" and

the "Land of Steady Habits"; land area, 4,820 sq.mi.; population (U.S. census, 1930), 1,606,903, estimated by the Bureau of Vital Statistics, July 1, 1939, 1,811,097. Capital, Hartford, 164,072. Other cities of over 50,000 population in 1930: New Haven, 162,655; Bridgeport, 146,716; Waterbury, 99,902; New Britain, 68,128. Of the State's population 1,131,770 were urban, or 70.4%; 1,576,673 whites; 29,354 Negroes; 1,222,267 native born; 384,636 foreign born.

History.—The principal State officers for 1939-40 are: governor, Raymond E. Baldwin (Republican, elected 1938, with 230,237 votes to 227,549 for Cross, Democrat, and 166,253 for McLevy, Socialist); lieutenant-governor, James L. McConaughy; secretary of State, Mrs. Sara B. Crawford; chief justice of the Supreme Court of Errors, William M. Maltbie (term 1930-46).

The general assembly of 1939 (Senate: 16 Republicans, 17 Democrats, 2 Socialists; House: 202 Republicans, 63 Democrats, 2 Socialists) was unusual for the leadership of young men with little previous experience and for freedom from the undesirable influences of lobbyists and bosses. In spite of severe cuts in departmental and institutional appropriations, unusual mandatory expenses produced the largest recorded biennial budget, \$106,206,491. The only additional taxation, an increase in the liquor tax, and the transfer of part of the cost of the State police to the highway account were, however, expected to provide a balanced budget for the first time in several years.

New legislation included reform of the minor court system, together with a proposed constitutional amendment to alter the appointment of the judges for those courts; revision of statutes concerning foods, drugs, and cosmetics to harmonize with Federal regulations; permission for alternate jurors in civil and criminal cases; requirement of uniform audit of town and municipal accounts; an anti-injunction law; and significant modifications of social security, labour, and liquor laws. Some desirable measures failed to pass because funds were not available for their administration. The current expenditures for the fiscal year ended June 30, 1939, were \$65,250,000. The State operated on a balanced budget and contemplates doing so in the current fiscal year.

No obvious change in political trends was revealed by the town and municipal elections of 1939, the only ones held during the year. With Judge Ernest A. Inglis presiding at one of the longest trials in the history of Connecticut's superior court, most of those under indictment for the Waterbury scandal were convicted. Various convictions were also obtained in connection with the Merritt parkway cases. The effects of these exposures and convictions have been salutary.

Education and Charities.—In the year 1938-39 there were 211,503 pupils enrolled in public elementary schools, and 84,926 in public high schools. A thorough reorganization of the State department of education was completed during the year; standards for the certification of teachers were improved; and a comprehensive study of the history of education in the State was inaugurated. The name University of Connecticut replaces that of *The Connecticut State college*, located at Storrs, where a \$3,000,000 building program is in progress. The State, in co-operation with the Federal Public Works Administration, is also erecting several new buildings at various State institutions, especially those for the care of mental cases, and is establishing a new school for the feeble-minded at South Britain and a new veterans' home at Rocky Hill.

Banking and Finance.—On Sept. 30, 1939, the 72 mutual savings banks in the State had total deposits of \$720,499,318 and total assets of \$812,565,097, being a slight increase over the previous year. The number of accounts increased to 977,993. In nearly all cases the dividend rate was 2½%. The 65 State banks and trust companies had total assets of \$358,767,197, a considerable

increase for the year. Hartford is the headquarters of most of the 25 large insurance companies operating under Connecticut charters. The admitted assets of the five life companies of Connecticut have grown to \$2,253,594,633, with 2,045,157 policies in force. In all companies there were 1,760,003 life policies in force in the State.

Highways.—The practical completion of the Merritt parkway and the beginning of work on the Wilbur Cross highway, which will continue the route through Hartford to the Massachusetts line, have been the notable achievements of the year in highway development. Special commissions have also been established to arrange for the construction of new bridges across the Connecticut at Hartford and across the Thames at New London. The system of State roads has nearly reached the point where it will no longer be necessary to develop new routes but rather to carry forward reconstruction of the existing ones on a more modern basis. The number of car registrations on Oct. 1, 1939 (468,312) and of licensed operators (549,259) exceed the record for any preceding full year. The ratio of accidents to highway use reached the lowest point recorded in 1938. Apparently this low record will be approximately equalled in 1939, thanks to the extensive campaign to promote highway safety.

Agriculture, Manufacturing.—Agricultural production of the State in 1939 showed increases for some crops but for others the yield was somewhat reduced by the prolonged dry weather in the summer. Both in acreage and in value the principal crops are tobacco, hay, potatoes, and corn. Fruit growing, gardening, and poultry raising are also conducted extensively. In number of chickens, turkeys, and cattle, especially milch cows, there has been some increase over previous records. Connecticut is, however, pre-eminently a manufacturing State. In 1937 the 2,892 factories employed 262,620 hands and produced goods valued at \$1,261,788,693, an increase of 40% over 1935. There was a similar increase in wages paid. Metal industries, notably brass, were the most important. In recent years the manufacture of aeroplanes and their parts has grown rapidly and the State now ranks third in the field. Industrial activity during 1938 was below the 1937 level but in 1939 there was considerable improvement. Time lost because of strikes was small. (G. M. Du.)

Conscientious Objectors: *see* PACIFISM.

Conscription: *see* ARMIES OF THE WORLD: *Military Service.*

Conservation, Soil: *see* SOIL EROSION AND SOIL CONSERVATION.

Contests: *see* ADVERTISING: *Contests*; RADIO, INDUSTRIAL ASPECTS OF.

Contract Bridge. The year 1939 brought no changes in Contract Bridge. Paradoxically, however, it enjoyed one of its most successful years. Its continued popularity was attributed to three major causes: (1) the laws, prepared in 1935 by the Whist Club of New York, the Portland Club of London and the Commission Française du Bridge of Paris, acting as a body, remained in force unchanged; (2) increased standardization in bidding methods, and (3) the bickering between rival factions in America and Great Britain was reduced to almost nothing.

When the present code of laws was adopted in 1935, the three collaborating committees promised there would be no material changes until 1940. This promise was kept and it wasn't until late 1939 that negotiations were entered into for the purpose of revising the laws. Meetings of the American Co-operating Committee started summer of 1939 and the new code will appear late in 1940. A new code governing Tournament Bridge is also being prepared by the American National Laws Commis-

sion and this code will also be published in 1940.

One of the major changes suggested to the Committee was the "Equalizing of the suits," that is, placing the minor suits (diamonds and clubs) on a par with the major suits (spades and hearts). Thus, four-odd in the minors would make game, as in the majors. This would leave the five-odd zone open. To fill this void, a "sub-slam" has been suggested with a small bonus—two or three hundred points—for the successful fulfilment of a five-odd contract. The Association of Playing Card Manufacturers and the *Bridge World* magazine sent out a questionnaire to thousands of players on these two proposals, and the vote was overwhelmingly in favour of them.

The Culbertson system, used by over 90% of the estimated 15,000,000 followers of the game, remained virtually the same except for two minor changes. The first was grafting to the system the Blackwood convention of slam-bidding. This convention caught the public's fancy and was made an auxiliary to the Culbertson 4-5 Notrump convention. The second change was the dropping of the Two-Way Three Bid and substituting for it a "strong" three bid. With a few variations, the three-bid now calls for a solid suit (at least six cards long) in the minors, a within-one-trick of solid suit in the majors, and no more than one honour-trick outside the suit. The hand, in general, should contain between 6 and $7\frac{1}{2}$ playing-tricks. Both these changes added power and flexibility to the system and did much to bind the Culbertson adherents into a more compact group.

The wars going on throughout the world did not affect contract bridge to any extent. The Eighth Annual World Bridge Olympic was held as usual in 1939 and among the warring nations competing were England, France, China, Japan, Finland, Russia, and Germany. In the latter country, the date was changed to the night following the regularly scheduled one because of a conflict with Hitler's birthday. The World Bridge Olympic Committee granted this change. In all, 52 countries took part in the Olympic and over 180,000 players competed.

An interesting sidelight on the effect of war on contract bridge was the report from England that the black-outs have caused a decided swing from club to home play. Fear of air raids has taken a secondary position to fear of traffic accidents, and as a result home play has been given a great stimulus—as proved by increased sales of playing cards and all bridge accessories. From the Maginot Line have come hurry calls for more cards and bridge scores, thus attesting to the popularity of bridge over the World War's favourite games—poker, blackjack, and red dog.

The American Contract Bridge League (an amalgamation of the American Bridge League and the United States Bridge Association) reported more interest and greater attendance than ever before at tournaments. Records of long standing were broken at the annual national championships at Asbury Park, N.J., and Pittsburgh, Pennsylvania.

The League instituted an annual nation-wide card party on St. Valentine's Day, the proceeds of which are for the relief of crippled and undernourished children. Over 50 cities held games, and in each case, the money taken in was used for some worthy charity for children. A local newspaper usually collaborated and the slogan of the card party, "Have a Heart—Take a Hand" was popularized in bridge circles all over the United States. Plans are under way to tie this movement up with the charitable activities of the American Legion.

Ely Culbertson went into temporary retirement for eight months during which time he wrote his autobiography, *The Strange Lives of One Man*. This book, he announces, will tell the full inside story of bridge—from its original idea to the paste-board empire it is today. In addition, Mr. Culbertson tells of his early life in Russia, Mexico, Canada, and France. (E. CUL.)

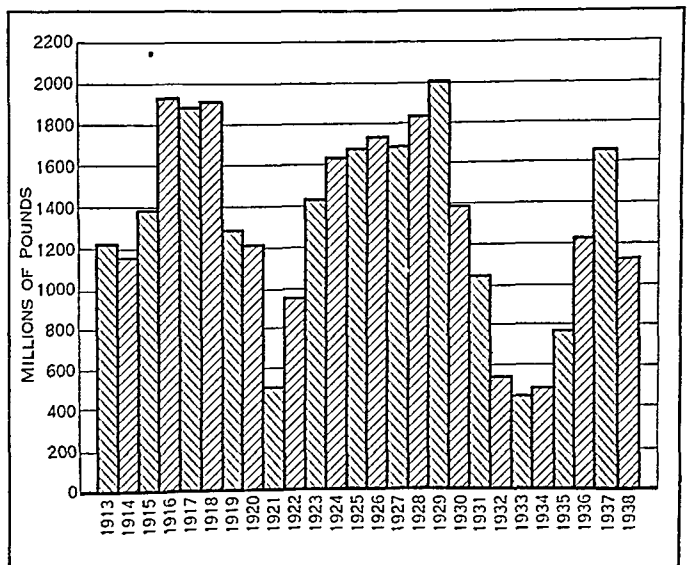
Co-operatives: see FARMERS' CO-OPERATIVES; MARKETING.

Copper. Nine copper-producing countries with outputs, present or past, in excess of 50,000 tons, accounted for 90% of the world total in 1929, and 86% in 1938, which is only a comparatively small change, but in the meantime there has been a radical change in the status of many of the individual producers. The United States proportion of the total has decreased from 49% to 25%, Belgian Congo from 7% to 6%, Mexico from 4% to 2% and Peru from 3% to 2%; on the other hand, Canada has risen from 6% to 13%, Chile from 16% to 18%, the Soviet Union from 1.3% to 5%, and Rhodesia from a fraction to 11%; Japan has remained approximately unchanged. All major countries except the United States, Mexico, Peru, and the Congo, and many of the minor ones, were still well above the 1929 level in 1938. Canada alone showed a material increase over 1937-10%, while the United States declined 34%, Belgian Congo 18% and Chile 15%.

World Production of Copper
(In thousands of metric tons)

	1929	1932	1936	1937	1938
Belgian Congo . .	135.5	54.0	95.7	150.6	124.0
Canada	109.9	113.7	191.3	238.1	263.3
Chile	316.8	103.2	256.2	412.9	351.4
Japan	75.5	71.9	73.8	75.9	77.0
Mexico	78.7	34.1	32.6	46.8	41.4
Peru	54.4	21.4	33.4	35.7	36.3
Rhodesia	5.9	73.0	140.0	212.7	215.3
U. S. S. R.	25.8	30.7	83.0	92.5	98.0
United States . .	931.1	231.8	557.9	757.4	502.1
World Total . .	1,921.6	905.5	1,677.9	2,271.6	1,981.6
Ex. U. S.	990.5	673.7	1,120.0	1,514.2	1,479.5

Statistics for 1939 are very incomplete since data are lacking for nearly all countries since the beginning of war in Europe. Such information as is available indicates a material improvement in United States output, probably about 30% for mine output, 33% for smelter output, and 26% for refinery output; sales to domestic consumers were up much more, pointing toward heavy withdrawals from stocks, which by mid-year had doubled since 1936. Canadian production rose 6% to 275,000 metric tons. During the first three quarters of 1939 output in Chile was at the rate of 298,000 metric tons; Mexico 43,500 tons; Peru 33,500 tons; and all of Africa 325,000 tons. Total world output should be somewhat greater than in 1938. During 1938, the international



COPPER PRODUCED in the United States; smelter output from domestic (including Alaskan) ores

copper cartel made three changes in production quotas; on Jan. 1, 1938, the operating rate was set at 100%; on March 1, at 95%; and on August 16, at 105%. The members of the cartel supply about 75% of the world total, and the percentage figures on which quotas are based refer to the operating rate at the time the cartel was formed, and not to the actual capacity of the plants, which is about 50% greater.

All of the countries listed in the table, with the exception of the United States, Japan, and the Soviet Union, are comparatively small consumers of copper, and hence produce mainly for export. The chief copper consuming countries, in order of importance, are the United States, Germany, the United Kingdom, Japan, the Soviet Union, and France, which cover 80-90% of the total consumption. The United States is the only major consumer with an export surplus; all others are dependent on imports for a large proportion of their supply. In spite of the fact that on the average 22% of the output is exported, consumption of copper in the United States far exceeds the new copper supply, the remainder coming from secondary metal recovered from previous use, a source which yielded a larger amount of copper during the depression years than was obtained from the primary production.

The United Kingdom, now third largest consumer, has only a nominal output, and secures practically its entire supply from imports, a growing amount of which is re-exported. About 55% of the imports is from Empire sources, 35% from the United States, and 10% from Chile. Ore and matte make up only about 2% of the imports, the remainder being divided in about equal proportions between rough copper and electrolytic. In 1938 Germany took second place as a consumer of copper, replacing the United Kingdom, while in 1937 Japan had replaced the Soviet Union in fourth place. Germany in 1938 consumed about 447,000 tons, 37% of which came from crude imports, 30% from refined imports, 9% from imported ore, 7% from domestic ore, and 18% from secondary recovery; exports are negligibly small. Russian production supplies about two-thirds of the demand, and imports one-third, while in Japan production is slightly less and imports proportionately higher. France has practically no domestic output, and imports almost the entire supply. (See also METALLURGY; MINERAL AND METAL PRICES AND PRODUCTION; STRATEGIC MINERAL SUPPLIES.) (G. A. Ro.)

Copra: see COCO-NUTS.

Copyright. During the year 1939, with the exception of the Print and Label Law, which transfers jurisdiction over these types of copyrightable material from the Patent Office to the Copyright Office effective July 1, 1940, no change has occurred in the provisions of the American Copyright Act.

On January 30 a decision was handed down by the Supreme Court of the United States in the case of *The Washington Publishing Co. Inc., Publishers, v. Drew Pearson, Robert S. Allen, and Van Rees Press, Inc., et al.* Under Section 12 of the Copyright Act the mandatory duty is imposed upon him who publishes with copyright notice and thereby secures copyright, of promptly thereafter filing with the Copyright Office two copies of the work accompanied by application for registration of claim of copyright therein. The section provides that "no action or proceeding shall be maintained for infringement of copyright in any work until the provisions of this Act with respect to the deposit of copies and registration of such work shall have been complied with." The facts before the Supreme Court were that A had published a book with copyright notice but had failed promptly to deposit and register as required by Section 12; that before such deposit and registration B infringed the copyright, whereupon A deposited and registered and brought suit for infringement against B. The

question before the Supreme Court was "Can A, after having deposited and registered, sue the infringer for infringement which occurred before such deposit and registration?" The answer of the Supreme Court was that the action would lie; and the point was emphasized that Section 12 did not provide that the delinquent depositor could not bring suit *unless* he registered promptly, but did provide that he could not bring suit *until* he registered. Under the Copyright Act the existence of the copyright is not made to depend upon deposit or registration. Once secured by publication with notice, copyright can only be lost in the ways designated in the statute, and failure promptly to deposit or register does not constitute one of these ways. (C. L. B.)

Corn (MAIZE). New, all-time high records of corn yields were established in 1939 in Illinois, Iowa, Ohio, Indiana, and Minnesota while for the entire United States the yield was the highest in 19 years, 28.6bu. to the acre, compared to 27.7bu. in 1938 and a ten-year (1928-37) average of 23 bushels. Although the United States Government has been encouraging reduced acreage of corn since 1934 the higher yields are attributed to the planting of more productive hybrid varieties of corn and the restric-

Table I. Corn Production by States in 1938 and 1939
(Reported by U. S. Department of Agriculture, Nov. 1, 1939)

	1939 bu.	1938 bu.	Average 1928-37 bu.
Iowa	504,236,000	468,923,000	393,143,000
Illinois	416,799,000	379,350,000	397,592,000
Indiana	211,344,000	173,389,000	151,195,000
Minnesota	204,579,000	157,535,000	136,346,000
Ohio	167,825,000	156,092,000	132,297,000
Missouri	114,520,000	106,550,000	113,655,000
Wisconsin	83,509,000	99,514,000	71,042,000
Texas	77,020,000	75,648,000	75,062,000
Nebraska	76,388,000	107,735,000	139,176,000
Kentucky	70,400,000	74,547,000	62,688,000
Pennsylvania	57,545,000	50,508,000	51,087,000
Michigan	54,741,000	53,035,000	43,167,000
Tennessee	51,620,000	68,570,000	60,308,000
North Carolina	47,151,000	46,398,000	41,355,000
South Dakota	41,456,000	35,688,000	54,933,000
Georgia	38,514,000	53,164,000	38,902,000
Alabama	37,275,000	49,700,000	39,427,000
Mississippi	36,412,000	48,544,000	36,262,000
Virginia	36,166,000	34,775,000	32,225,000
Arkansas	34,364,000	36,218,000	29,956,000
Kansas	32,487,000	45,200,000	80,736,000
Oklahoma	28,232,000	35,080,000	35,912,000
South Carolina	25,443,000	26,767,000	21,335,000
Louisiana	24,540,000	26,730,000	20,908,000
New York	23,485,000	25,345,000	21,221,000
Maryland	18,216,000	18,537,000	15,617,000
North Dakota	15,856,000	16,186,000	16,305,000
New Jersey	7,215,000	7,486,000	7,186,000
Colorado	6,868,000	11,319,000	15,771,000
Florida	6,158,000	8,452,000	6,733,000
Delaware	4,176,000	4,147,000	3,861,000
Vermont	3,049,000	3,120,000	2,803,000
New Mexico	2,916,000	2,606,000	2,928,000
Wyoming	2,260,000	2,880,000	2,077,000
California	2,108,000	2,077,000	2,386,000
Connecticut	1,920,000	1,704,000	2,005,000
Montana	1,771,000	2,340,000	1,259,000
Oregon	1,707,000	1,595,000	1,604,000
Massachusetts	1,482,000	1,482,000	1,606,000
Washington	1,190,000	1,015,000	1,168,000
Idaho	1,089,000	1,184,000	1,225,000
New Hampshire	600,000	650,000	599,000
Maine	520,000	440,000	489,000
Utah	450,000	500,000	457,000
Arizona	390,000	495,000	502,000
Rhode Island	351,000	400,000	347,000
Nevada	60,000	62,000	49,000

tion of acreage to more productive land. The 1939 crop in the United States was estimated by the Department of Agriculture

Table II. Corn Production for Certain Countries, 1938 and 1939
(Reported by International Institute of Agriculture)

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
Rumania	245,636,000	201,462,000	Union of South Africa	101,411,000	74,284,000
Yugoslavia	145,434,000	187,232,000	Uruguay	6,476,000	5,246,000
Italy	90,500,000*	115,599,000	Madagascar	3,937,000	3,684,000
Hungary	88,552,000	104,801,000	Chile	2,211,000	2,464,000
Greece	6,791,000	7,853,000	New Zealand	269,000	333,000
Argentina	191,485,000*	327,671,000			

*United States foreign service reports.

November 1 as 2,591,063,000bu., compared to 2,542,238,000bu. in 1938 and a ten-year (1928-37) average of 2,309,674,000 bushels. In Canada, October estimates by the Dominion Bureau of Statistics placed the 1939 crop for husking at 7,566,000bu., as against 7,690,000bu. in 1938.

The Institute reported the corn acreage of Germany in 1939 as 255,000ac. compared to 347,000ac. in 1938 when 14,944,000bu. of corn was harvested, including Austria and the Sudeten; in France a 1939 acreage of 814,000 compared to 841,000ac. in 1938 when the crop was 22,779,000 bushels. In Bulgaria the 1939 acreage was 1,527,000 as against 1,731,000ac. in 1938 when the crop was 20,955,000 bushels. No 1939 estimates for Russia were available, but the 1938 crop was reported as 108,592,000bu. while that of Manchoukuo was 98,814,000bu., Egypt 61,834,000bu., and Turkey 23,759,000 bushels. (See also CEREALS.) (S. O. R.)

Cornell University. A non-sectarian, co-educational institution in Ithaca, N.Y., founded in 1865 and incorporated as a land-grant college under the Morrill Act of 1862. The university comprises the endowed schools and colleges of arts and sciences, engineering, architecture, law, and medicine (located in New York and operated in conjunction with the New York Hospital), and the State-supported colleges of agriculture, home economics, and veterinary medicine. Two experiment stations, at Geneva and Farmingdale, are operated in connection with the college of agriculture. Degrees for advanced study other than professional are awarded through a graduate school. During the academic year 1938-39, there were 7,055 students, of whom 1,597 were women. The faculty, which had 1,691 members, included 50 emeritus professors, 318 professors, 273 assistant professors, 23 lecturers and associates, 464 instructors, and 563 assistants. An important development on the campus during the spring of 1939 was the establishment of a Federal nutrition research laboratory, the program of which will be co-ordinated with the programs of the related departments of the university. Productive funds on June 30, 1939, amounted to \$30,872,433. Land and buildings were valued at \$19,692,679, and equipment at \$7,841,343. The library contained 1,036,404 volumes. President, Edmund Ezra Day, Ph.D., LL.D. (E. E. D.)

Corundum. The United States has no production of corundum, the natural oxide of aluminium, and depends entirely on imports, which vary from 2,000 to 4,000 long tons annually, mainly from South Africa. Extensive deposits are known in the Zoutpansberg, Pietersburg, and Leydsdorp district of Northern Transvaal, and these now furnish the bulk of the world supply; the 1938 sales were 1,549 short tons, against 4,851 tons in 1936. From 1905 to 1921 Canada was the leading producer. (G. A. Ro.)

Cosmetics: see DRUGS AND DRUG TRAFFIC; SOAP, PERFUMERY AND COSMETICS.

Cosmic Rays: see PHYSICS.

Costa Rica, a Central American republic; language, Spanish; capital, San José (pop. 63,436); president, León Cortés; area, 23,000 sq.mi.; population (1936 estimate), 606,581.

Costa Rican activity during 1939 was largely in connection with foreign relations. Throughout the year efforts to adjust the country's foreign debt were made, but without success. In March, Congress levied a 100% duty on goods from countries whose sales to Costa Rica exceeded their purchases by 50%. Japan was the chief nation affected. Early in the year proposals in the United States Congress that Cocos island, uninhabited Costa Rican territory in the Pacific, 300mi. from the mainland, be leased or pur-

chased as part of the Panama canal defences, attracted considerable attention, and, in September, a military detachment was sent to occupy Cocos to prevent its use by belligerents during the European war. Efforts by Nicaragua to induce Costa Rica to sign a treaty for the canalization of the San Juan river were made in October, but without result. In December, Costa Rica vigorously protested Russian aggression against Finland.

Costa Rica has external communication by sea and by Pan American Airways, supplemented by the partially complete Inter-American highway. Internal communication is by several domestic airlines, 450mi. of railway, and an 1,800mi. highway system.

In 1938, imports (principally foodstuffs and manufactured goods) increased slightly, to \$12,620,721 (United States, 49.1%; Germany, 19.8%); exports declined 12½%, \$10,145,614, going largely to the United States, Great Britain, and Germany. Coffee and bananas, supplying 48.7% and 27.6% of exports, are the mainstay of Costa Rican economy, although cacao is also important. Banana production rose during 1938 and 1939 due to development of plantations on the disease-free Pacific coast. Gold production in 1938 was in excess of \$500,000 value.

The monetary unit is the colon (value: 17.79¢ U.S.). In 1939 the national expenditures were estimated at 31,299,000 colones, but unexpected decline in revenues compelled downward revision. Education was allotted 17%. Costa Rica, cultural centre of Central America, has 606 public elementary schools, with an enrolment of 54,750 in 1937. (L. W. Be.)

Costigan, Edward Prentiss (1874-1939), U.S. senator and lifetime liberal, was born in King William county, Virginia, on July 1. After graduating from Harvard in 1899 he established law practice in Denver. He was a founder of the Progressive or "Bull Moose" party which nominated Theodore Roosevelt for President in Aug. 1912. Costigan ran for governor of Colorado on the same political ticket but was defeated. Later he made his peace with President Wilson, who appointed him to the U.S. Tariff Commission in 1917. His espousal of the flexible tariff met with constant criticism from the Republican administrations of 1920 and 1924, and he resigned in 1928. He was in the Senate from 1931 until his retirement in 1937, and sponsored such legislation as a sugar-quota bill and the famous Costigan-Wagner anti-lynching bill which was a political football in the Senate for several years. Costigan died in Denver January 17.

Cost of Living. The upward trend of the cost of living characteristic of almost the entire world after 1933 continued into 1937-38, but only in France and Norway (excluding war areas) did 1937-38 indexes of food prices go higher than in 1929. In most nations 1937-38 food prices were higher than 1936 and higher again in 1939. The outbreak of the European war was stimulating the upward movement of prices during the last half of the year. Great Britain, Finland, Belgium, Norway, and Switzerland experienced almost a 10% increase in food prices in 1937-38 but during the first half of 1938 cost of living stabilized at approximately the 1937 levels in most of the nations. In 1939 there was a slight increase during the early part of the year and a more substantial upward movement during the late summer and fall.

The inclusion of rent, clothing, fuel and sundries in a cost of living index tends to increase its stability as compared with an index based upon food prices only. The latter fluctuate faster and more sharply. This is apparent when the British, Canadian, and American indexes are examined. The accompanying table includes a varied assortment of items and not merely food costs.

The detailed figures of the United States, Canada and the

Indexes of Cost of Living for Specified Periods for the United States and Certain Foreign Countries
(Series recalculated by International Labour Office on base 1929=100; a=food; b=heating and lighting; c=clothing;
d=rent; e=miscellaneous)*

Country	Australia	Canada	France		Germany	Gr. Brit. & N. Ireland	Italy	New Zealand	Norway	Sweden	So. Africa	U.S.
Towns and localities	30	60	Paris	45	72	509	50	4-25	31	49	9	32-51
Original base=100	1923-27	1926	1914	1930	1913-1914	July 1914	June 1928	1926-1930	July 1914	July 1914	1914	1923-25
Composition of index	a-c	a-c	a-c	a-c	a-c	a-c	a-c	a-c	a-c	a-c	a-c	a-c
1929	100	100	100	..	100	100	100	100	100	100	100	100
1933	78	78	94	87	77	85	80	79	89	91	88	76
1937 March . . .	84	82	100	97	81	92	87	90	97	95	90	84
June	85	83	109	99	81	95	92	91	100	95	91	85
Sept.	85	84	113	104	81	96	95	93	102	97	91	85
Dec.	86	84	118	110	81	97	98	95	103	97	94	85
1938 March . . .	88	84	124	113	81	94	98	94	103	97	94	83
June	88	84	124	115	82	97	..	94	104	88	94	84
Sept.	88	84	124	117	81	95	97	95	102	98	93	83
Dec.	88	83	130	120	81	95	99	96	102	98	93	83
1939 March . . .	89	83	..	122	82	93	99	96	102	99	94	82
June	90	83	..	123	82	95	102	98	104	99	94	..

*Table from *International Labour Review*, July 1938 (p. 142) and Oct. 1939 (p. 567). Quarterly averages for 1937 computed in February, May, August and November. Australian and French figures are for February, May, August and November instead of months listed in the table.

United Kingdom reveal that the trends of prices of different foods varied considerably, 1937-39. The figures appear in the *International Labour Review*.

The accompanying table shows the relative trends of cost of living in 11 countries from 1929 through June 1939. The figures have been recalculated by the International Labour Office on a 1929 base and this table cannot be compared directly with the table published for 1937 and previous years. (See also FINANCIAL REVIEW; PRICES; WEALTH AND INCOME, DISTRIBUTION OF.)

BIBLIOGRAPHY.—Readers interested in additional information are referred to current issues of the *Monthly Labor Review* (U.S. Bureau of Labor Statistics), the *Ministry of Labour Gazette* (British Ministry of Labour), and *The Labour Gazette* (Department of Labour, Canada). Cf. also *International Labour Review*. (D. D. L.)

Cotton. The "cotton year" begins August 1 and ends July 31. Thus, in the year 1939-40 the cotton crop in the northern hemisphere is harvested in 1939 and the southern hemisphere crop in 1940. World supply of all growths of cotton for the year 1939-40, ending July 31, 1940, was estimated by the U.S. Department of Agriculture on Nov. 27, 1939, as about 49,300,000 bales. This is only slightly less than the record supplies of 50,046,000 bales in 1937-38, and 50,550,000 in 1938-39. It includes world production in 1939-40 of 27,800,000 bales and a world carry-over Aug. 1, 1939, of 21,500,000 bales. World production in 1938-39 was 27,407,000 bales and the world carry-over 22,639,000 bales. In 1937-38 world production was 36,784,000 bales and world carry-over 13,766,000 bales.

World mill consumption in the period 1939-40 is expected to be about the same as the year's production, increased consumption in the United States offsetting decreased mill activity in parts of Europe.

World mill consumption in the period 1938-39 was 28,500,000 bales. The record year in world mill consumption was 30,600,000 bales in 1936-37.

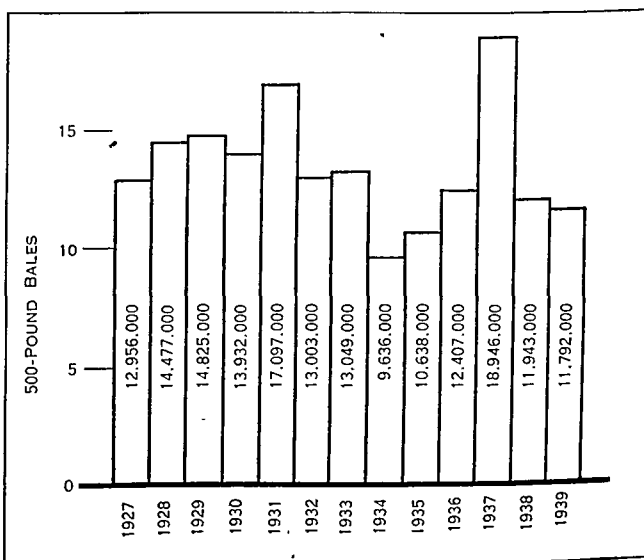
The world supply of United States cotton in 1939-40 was estimated at 25,700,000 bales. This is only slightly below the peak of 26,224,000 bales in 1932-33. It includes a world carry-over of United States cotton of 14,030,000 bales of 478lb. net, which is a new high. World supply of United States cotton in 1938-39 was 25,377,000 bales, with 13,712,000 bales in the carry-over; in 1937-38 world supply of United States cotton, 24,647,000 bales, with a carry-over of 6,235,000 bales. The United States crop harvested in 1939 was estimated Dec. 1, 1939, by the Department of Agriculture as 11,792,000 bales of 500lb. gross each, with an indicated yield of 235-glb. of lint cotton per acre from 23,928,-

000ac. harvested after abandonment of 3.6% of the 24,832,000ac. in cultivation July 1, 1939. The United States crop harvested in 1938 was 11,943,000 bales and the ten-year (1928-37) average 13,800,000 bales.

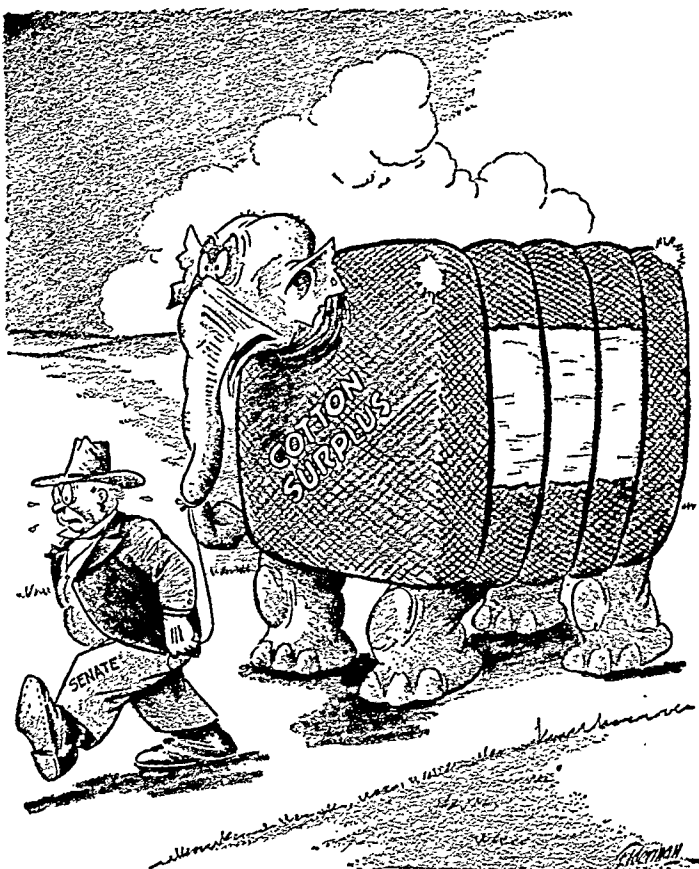
Close governmental control over cotton and cotton goods was established by practically all European nations with the outbreak of war in Sept. 1939. Belligerents declared cotton a conditional contraband, subject to seizure. Non-combatants adopted control to conserve supplies and to avoid violation of neutrality. Germany had had increasingly comprehensive cotton control since 1933, including compulsory use of substitutes, chiefly rayon, as a part of cotton fabrics. On Dec. 1, 1939, Great Britain, revived the "Navi Cert" plan which was adopted March 11, 1916, during the World War, and which provides for certification of neutral export cotton at ports of shipment, thus avoiding or expediting inspection for contraband at sea.

France and Great Britain both instituted complete Government control of imports and trade in cotton and cotton goods, British control being under the Board of Trade, with a cotton board set up to administer control, including the primary duty of providing for governmental needs; also, to promote exports of cotton goods and, if necessary, to allocate supplies.

In the United States during the first three months of the European war the average farm price for cotton was 8.85¢ per pound, about 7% higher than a year earlier, but 2.2¢ below the ten-year (1928-37) average. In support of an export market the Federal Government on July 27, 1939, adopted a plan to pay an export subsidy of 1.5¢ per pound. This, with the subsequent war demand, greatly increased exports. On Dec. 6, 1939, the Government reduced payments on export cotton to 0.75¢ per pound. Two days later payments were reduced to 0.40¢ per pound, and on December 11 to 0.20¢ per pound. On June 23, 1939, the United States arranged to exchange more than 600,000 bales of Government



COTTON CROP in the United States. The figure for 1939 is the Department of Agriculture's December estimate



COTTON was "the white elephant from the south" in 1939, according to Elderman of *The Washington Post*

owned cotton with Great Britain for rubber. As a further effort to broaden foreign markets for United States cotton the Department of Agriculture subsidized a one-variety program of exports to counteract complaints of foreign spinners that United States cotton lacked uniformity and was badly packaged. In 1938-39, under this program, 3,800 bales of especially-prepared cotton were exported. This, the department announced, is to be increased to 30,000 bales in 1939-40. From August 1 to November 24 United States cotton exports of 2,200,000 bales were almost 50% larger than the unusually low exports for the same period in 1938, exports to Great Britain being nearly four times larger and to other European countries, other than German controlled, 15% to 70% larger, while exports to Japan were 16% smaller. Cotton mill operations in Japan in 1939 were curtailed by Government restrictions on electric current and fuel. Chinese cotton imports, however, for the year ending Sept. 30, 1939, were 1,020,546 bales, the highest since 1931-32 and 25 times more than in 1938. The Japanese effort to produce cotton in Taiwan had its third successive unsatisfactory year, the 1939 crop being estimated at 5,000 bales from 28,764 acres. The 1939 Chinese crop was estimated at 2,000,000 bales, the smallest in more than 20 years.

The United States Government held in late November more than 10,100,000 bales of cotton (excluding cotton in the rubber barter with Great Britain). Of this, 6,100,000 bales were owned by the Government and 4,000,000 bales were held as collateral for Government loans to farmers. On Dec. 9, 1939, United States farmers voted for the third consecutive year in favour of the Department of Agriculture marketing program. Preliminary returns showed that 812,420 farmers voted for, and 78,047 voted against, marketing quotas for the 1940 crop. (S. O. R.)

Cotton Manufacture.—The cotton-textile industry of the United States and the world, which in recent years has suffered from the disturbing and, to some extent, contracting effects of

complex competitive impulses such as (1) synthetic fibres, (2) new industries in hitherto agricultural countries and sections of countries, (3) new technique, and (4) new forms of governmental participation, experienced a new impact in 1939: that of the war in Europe. The importance of this as a factor contributing toward further dislocation in both combatant and neutral countries is obvious. Its influence may not be as permanent or far-reaching, as that of a long-term trend such as the expansion of synthetic fibres for example, but for 1940 at least the war is Industry Problem No. 1.

War's first effect on the cotton-textile industry of the United States can best be described as that of a shot in the arm. Prior to the outbreak of hostilities, mill activity had been proceeding at a higher rate than that of the depressed year 1938, in the face of a rather listless demand with resultant inventory accumulation and profitless prices. The war changed all that. Sudden demand, largely speculative in character, forced prices up, restored profit margins, and impelled capacity operations of all cotton mills. The net result was a 25% higher rate of mill activity in 1939 than in 1938 and one which exceeded the previous record rate of 1937. The year 1939 closed with the industry optimistic, and with apparent prospects for a lasting return of profits in cotton manufacture. Coupled with improved conditions within the United States was expectation of expanded export markets. However there were so many imponderables in the situation that it was difficult to see much beyond three months at a time.

Wage-Hour Legislation.—Second only to the war abroad as a factor in the development of the United States cotton-textile industry in 1939 was what threatened to be another War Between the States, at least so far as this industry was concerned. The cause was the recommendation of a minimum wage of 32½¢ under the wage-hour law, for the cotton, rayon, and silk divisions of the textile industry. The law, which became effective Oct. 24, 1938, set a mandatory minimum of 25¢ for all industries covered, commencing with that date, and a minimum of 30¢ to take effect Oct. 24, 1939. The first industry committee appointed by the wage-hour administration was the textile committee. Its recommendation, in March, of a flat 32½¢ wage aroused a storm of protest from the cotton-textile industry of the South, on the basis that it was entitled to a differential below the rate for the North. Prolonged hearings were held before the administrator, and much heat was engendered on both sides. Finally, on September 13, the wage-hour administrator announced the acceptance of the 32½¢ recommendation, to take effect Oct. 24, 1939, instead of the 30¢ wage mandatory under the law. What had threatened to be a major explosion, however, turned out to be only a little firecracker, since by that time the industry was in the first stages of activity induced by the war in Europe, and the minimum wage advance became a minor issue. However, the controversy promises to rise again when slack times return in cotton manufacture. In addition, the importance of the minimum wage is its potential stabilizing effect as a factor to prevent wage-chiselling and subsequent market collapse during times of depression.

Another activity of Government affecting the American cotton manufacturing industry during 1939 was the imposition of an export subsidy of 1½¢ per pound, effective July 27. This represented an attempt to win back the export market for cotton. So sharp was the increase in export sales during the succeeding months, however, due largely to the outbreak of the war and to the removal of the uncertainty which had preceded the decision on the subsidy, that subsidy funds were quickly exhausted and in the late fall a series of cuts reduced and practically eliminated subsidy payments.

Of major importance in the outlook for 1940 was the question of revival of a processing tax to finance farm payments. Although

known as the Certificate Plan, the proposed scheme is essentially the same as the processing tax. Prospects for and against its adoption were about even as Congress convened early in 1940.

The Battle for the Markets.—Despite the stimulating effect of the war on cotton consumption in 1939, cotton continued to be on the defensive during that year. It still had to fight desperately to hold its markets not only against the competition of the old-line fibres but against the encroachment from new synthetics as well as from products of other industries such as paper, etc. Of the new fibres the best publicized was Nylon, but its initial threat was directed largely against silk, in full-fashioned hosiery. Vinyon, which also came into fruition in 1939, was more directly a cotton competitor in that much of the early experimentation was in the industrial-fabric field, where cotton has held sway. More important than either of these, however, was the growing use of staple fibre, which differs from the ordinary or continuous-filament rayon, in that it is supplied in cut lengths to be spun on standard textile equipment. Consumption of staple fibre in the United States alone grew from less than 1,000,000lb. in 1930 to approximately 100,000,000lb. in 1939. The latter year showed nearly 100% increase over 1938. The competition from outside products such as paper continues to be most serious from the standpoint of the cotton manufacturer. Excellent merchandising on the part of manufacturers of paper products, particularly those intended for the home, has been a threat to manufacturers of towels, table linen, etc.

However, the cotton industry has accepted the challenge from these various sources and is putting up a good fight for its markets. Active programs launched by the cotton manufacturers themselves, by groups of interests allied with the raw cotton trade, by large retailers who have been pushing the use of cotton bags, and by Government departments, have been co-ordinated gradually into an aggressive movement. New uses such as employment of cotton fabric for covering cotton bales, for erosion control, for lining of irrigation ditches, etc., hold promise for the cotton industry. The projection of four regional research laboratories under the U.S. Department of Agriculture, to be located at Peoria, Ill., New Orleans, La., Philadelphia, Pa., and San Francisco, Calif., is an important potential in the fight. National Cotton Week in 1939 set a new record.

Technological Developments.—The trend toward increased efficiency, higher speeds, and more completely automatic operation in textile equipment has continued unabated. In fact, that trend has been accelerated by the increases in mill costs arising from Federal wage-hour legislation. By reducing the possibilities for price-cutting through wage-cutting, the minimum wage has forced manufacturers to adopt modern equipment if they are to continue to exist. Most of these improvements had their start earlier than 1939, but one interesting development belonging to that year was the introduction of paper bobbins for use on cotton spinning frames. This practice, which had already been adopted quite widely in Europe, had for its purpose the elimination of vibration resulting from operation of the frames at increasingly high speeds. In addition to the expanded use of more efficient equipment, new and versatile finishes such as pre-shrunk finishes, crease-resisting finishes, etc., are playing an important part in the technological progress of the cotton industry.

Employer-Employee Relations.—One of the interesting developments in 1939 in industrial relations in the cotton-textile industry was the start of the movement to put the mill village in southern cotton mills on a more rational basis. These villages have been carried at a loss, representing a financial burden on the operation of the mill, and also inviting unfair wage comparisons with other sections of the country. A number of mills took steps in 1939 to arrange for the sale of their villages to

the employees, not only to eliminate these disadvantages but also to encourage home-ownership. At the same time, consideration was being given to the possibility, in those mills where the villages were not to be sold, of separating the finances of the village from the mill, and placing the differential in the pay envelope. This promises to progress and to eliminate one of the difficult phases of industrial relations in the South. In addition, steps have been taken to inform both the general public and the employees concerning the actual status of working and living conditions in southern cotton mills, with excellent results. Campaigns such as those conducted by the Cotton Manufacturers Association of Georgia, and the Cotton Manufacturers Association of South Carolina, as well as the publication of the book *Faces We See* by Mildred G. Barnwell of the Southern Combed Yarn Spinners Association—a photographic record of mill life in the plants of that group—and the release of an industry-financed moving picture have been constructive influences.

Conclusion.—From the above it will be recognized that, although the cotton industry has faced and is facing a strenuous fight, it has been organizing on several fronts for the successful waging of that fight. Through promotion, co-ordination, technical advance, and industrial relations effort, it has launched a constructive and positive program. (See also LINEN AND FLAX; RAYON; TEXTILE INDUSTRY; WOOL; etc.) (D. G. Wo.)

Cottonseed Oil: see VEGETABLE OILS AND ANIMAL FATS.

Coulter Shoals Project: see TENNESSEE VALLEY AUTHORITY.

Countries of the World, Areas and Populations of the: see AREAS AND POPULATIONS OF THE COUNTRIES OF THE WORLD.

"Courageous": see EUROPEAN WAR; SUBMARINE WARFARE.

Cowles, Henry Chandler (1869–1939), U.S. botanist and educator, was born at Kensington, Conn. on February 27 and was educated at Oberlin college (A.B., 1893) and at the University of Chicago (Ph.D., 1898). After teaching in Nebraska and acting as a special field assistant for the U.S. Geological Survey, he joined the faculty of the University of Chicago in 1902, later advancing to a professorship. From 1925 until his retirement in 1934 he was chairman of the university's department of botany. He specialized in plants of the Chicago area and was one of the first botanists to do research in plant ecology. In 1918 he was president of the Ecological Society of America, in 1922 president of the Botanical Society of America, and in 1930 president of the ecology section of the International Botany Congress. He died at Chicago September 12.

Crane, Charles Richard (1858–1939), American industrialist and diplomat, was born in Chicago on August 7. From 1894 to 1912 he was first vice president of the Crane company, manufacturers of plumbing equipment; he was president from 1912 to 1914. President William Howard Taft appointed him minister to China in 1909, but the Japanese Gov't strongly protested his nomination on the grounds that he was anti-Japanese. At the instance of Sec'y of State Philander Knox, Crane was recalled before he had left the country to take his post. He then broke with the Republicans and became vice chairman of the finance committee for Woodrow Wilson's campaign in 1912. President Wilson appointed him a member of a special diplomatic commission to Russia in 1917. He was American commissioner on mandates in Turkey in 1919 and U.S. minister to China from 1920 to 1921. He died February 15 at Palm Springs, Calif.

Crawford Medal: see PHILATELY.

Cricket. The 1939 cricket season in Great Britain was interrupted by plentiful rain and finally cut short by the outbreak of war. But it was made most enjoyable by the visit of a West Indian side, captained by R. S. Grant and including such heroes of the past as Headley and Constantine.

There were three test matches. The first, played at Lord's, was won by England, by eight wickets, with half an hour to spare. Hutton and Compton batted finely, but the feature of the match was a century in each innings by George Headley.

The second test match at Manchester was drawn, largely owing to Manchester's proverbial rain. The third, at the Oval, also ended in a draw, after high scoring on both sides. Hutton and Hammond for England, Weekes and Constantine for the West Indies, all giving splendid exhibitions of batting. All through their tour the West Indians endeared themselves to the crowds by their brilliant fielding, free batting and that air of jollity with which they always seem able to invest their cricket. Grant led them just as such a side of happy cricketers should be led, and every lover of the game was glad to see them give an excellent account of themselves.

The county championship was again won by Yorkshire, with Middlesex second and Gloucestershire third. Yorkshire, as so often in past years, brought into the field an all-round excellence and a will to win which were too much for most of their opponents, though they were twice beaten by Gloucestershire. Even when test matches made heavy calls on their front line players, a second line of "unknowns" appeared and made one wonder at the limitless resources of this great cricketing county. Sutcliffe showed much of his old form and finished with an average of over 54. Hutton batted in great style while Verity and Bowes finished first and second in the bowling averages. The Oxford and Cambridge match was won by Oxford, by 45 runs, but only after Cambridge had made a most gallant second innings effort, totalling 384 runs, Dickinson making 100 and Webster (the side's fast bowler) a very brave 60. The Eton and Harrow match was perhaps the match of the year. It was won by Harrow for the first time since 1908.

Towards the end of the year came news of the Sheffield Shield matches in Australia. Don Bradman was in his usual terrific form and began scoring century after century for South Australia. O'Reilly seemed to be bowling as craftily as ever, and Grimmett showed what a grave mistake was made when he was omitted from the last Australian side to visit England.

War started just before the cricket season was due to end, and leading cricketers made haste to offer their services to their country. It will be good to hear the sound of bat and ball again on village greens and county grounds.

Final positions in the county championship
(1938 positions shown in parentheses)

	P.	W.	L.	D.	Tie	First innings lead in		Pts.	Average
						Matches lost	Matches drawn		
Points awarded	—	12	—	—	6	4	4	—	—
1. Yorkshire . . . (1)	28	20	4	4	0	2	3	260	9.28
2. Middlesex . . . (2)	22	14*	6	2	0	3	1	180	8.18
3. Gloucestershire (10)	26	15	7	4	0	1	3	196	7.53
4. Essex . . . (6)	24	12	10	2	0	4	2	170†	7.08
5. Kent . . . (9)	26	14	9	3	0	2	1	180	6.92
6. Lancashire . . (4)	21	10	6	5	0	3	2	140	6.66
7. Worcestershire (11)	27	11	10	5	1	2	4	162	6.00
8. Surrey . . . (3)	24	11	7	6	0	0	2	140	5.83
9. Derbyshire . . (5)	25	10	8	7	0	1	5	144	5.76
10. Sussex . . . (8)	29	10	12	7	0	1	4	140	4.82
11. Warwickshire (13)	22	7	8	7	0	1	2	98†	4.45
12. Nottinghamshire (12)	23	6	8	9	0	2	5	100	4.34
13. Glamorgan . . (16)	24	6	8	10	0	1	5	96	4.00
14. Somerset . . . (7)	27	6	11	9	1	2	4	102	3.77
15. Hampshire . . (14)	26	3	17	6	0	8	4	84	3.23
16. Northants . . (17)	22	1	12	9	0	3	3	36	1.63
17. Leicestershire . (15)	20	1	14	5	0	1	0	16	0.80

*Includes one win in one-day match (8 points).

†Includes two points for tie on first innings in match lost.

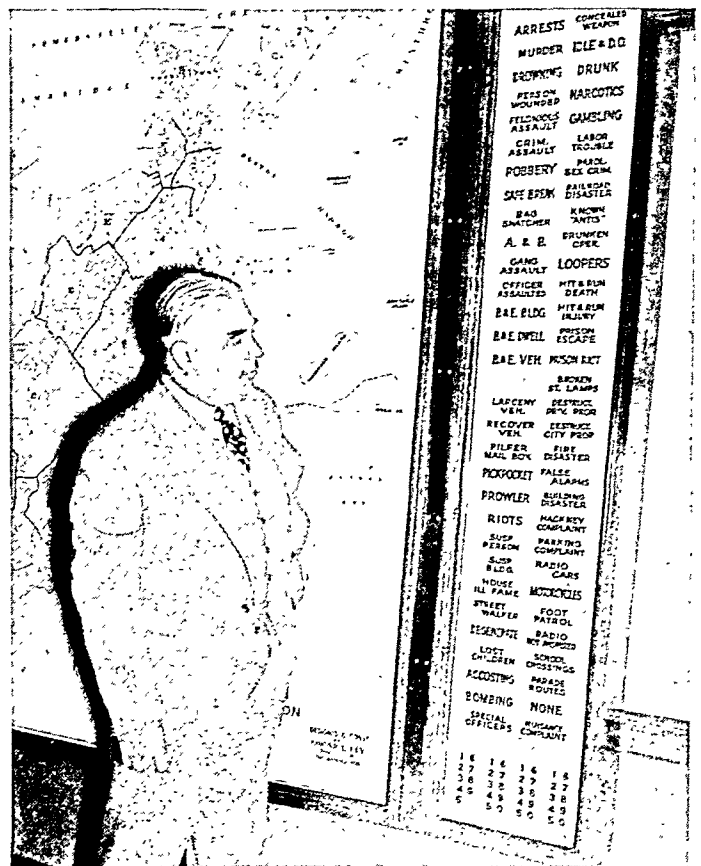
Crime. The *Uniform Crime Reports*, which have been continuously published since 1930, continue to grow both in scope and in completeness. As of Dec. 1, 1939, these reports cover 93.6% of all cities and towns in the U.S. with over 10,000 population, and 98.0% of the total population of this group of communities. In addition, crime reports are compiled for a large number of small municipalities, and some rural areas. Using these sources as an index for the country as a whole, the Federal Bureau of Investigation estimates that a total of 1,433,812 "reportable offences" (comprising eight selected types of crimes) were committed in the United States during 1938. This represented an increase of 1.3% over the total of a similar estimate for 1937.

Crime in Cities, Towns and Villages.—For the ten-year period beginning with 1930, there was a gradual decline in all classes of reportable crimes, except for rape and larceny, which increased perceptibly. In addition, aggravated assaults and burglaries increased in 1939, as compared with their 1938 levels. Whether these recent changes foreshadow a return to the higher levels recorded in the first half of the decade, is as yet uncertain. Auto thefts continued their almost unbroken decline, and reached a new low.

The following comparisons are based upon returns from 1,964 cities, towns and villages in 1939; from 1,894 such communities in 1938 and 1,759 in 1937:

Offences Known to the Police
January-September, Inclusive; 1937-1939; Rate per 100,000 of Population

Offence	1937	1938	1939	Offence	1937	1938	1939
Murder and Non-negligent Manslaughter . . .	4.6	3.9	4.0	Robbery	40.0	42.4	40.7
Manslaughter by Negligence	4.1	3.1	2.9	Aggravated Assault or Entering . . .	35.5	32.8	34.3
Rape	6.5	6.3	6.8	Burglary—Breaking or Entering . . .	237.4	243.0	259.4
				Larceny—Theft . . .	559.9	584.9	652.1
				Auto Theft	157.9	134.8	128.8



THE TYPE OF CRIME and where it was committed is speedily recorded on a new device invented by a member of the Boston police department

It was again demonstrated in 1939 that there are fairly well-defined areas of both low and high crime frequency. The New England and Middle Atlantic States continue to have the lowest urban crime rates, with the South Atlantic, East South Central and Pacific Coast States reaching the highest levels.

With respect to the broad generalization that the larger the city, the higher the crime rate, 1939 showed an impressive consistency in the application of the rule. With all cities grouped according to size, the largest cities had the highest rates, and the others followed in regular order of descending scale. Group I cities (those having in excess of 250,000 population) and Group II cities (those having a population between 100,000 and 250,000), were as usual so nearly equal that a very slight change would affect their relative standing. Thus in 1937, Group I cities held the lead; in 1938, Group II cities went into first place by a narrow margin; and now in 1939, a slight shift has again placed Group I cities in the highest crime bracket. The other four groups followed in their usual order.

In 1939, the relative frequency of reportable offences showed the following crimes in a leading position; larceny, 57.7%; burglaries 23%; auto thefts 11.4%; robbery 3.6%. As compared with 1938, larcenies increased in relative frequency from 55.7%; the others listed above showed small declines. All of these, representing 95.7% of the total, are crimes against property involving unlawful gain as a motive. The rather small residue of 4.3% represents attacks upon persons, viz., homicides, rapes, and aggravated assaults. The following table presents the per capita rate of offences known to the police, for the first three quarters of 1939, in 1,964 cities, towns, and villages having a total population of 62,271,928:

Crime Rates per 100,000 Population
January-September, Inclusive, 1939
(000 omitted)

	Population Groups of Cities						Total
	I Over 250	II 100-250	III 50-100	IV 25-50	V 10-25	VI under 10	
Murder and Non-Negligent Manslaughter	4.5	4.5	4.3	3.0	2.7	2.5	4.0
Manslaughter by Negligence	4.0	3.2	2.1	1.5	1.4	1.5	2.9
Rape	8.2	5.7	5.1	5.6	5.0	6.6	6.8
Robbery	56.5	39.2	32.3	23.3	18.9	16.4	40.7
Aggravated Assault	36.2	40.1	46.2	30.1	26.3	17.3	34.3
Burglary—Breaking or Entering	281.5	324.2	268.1	253.2	195.9	172.2	259.4
Larceny—Theft	713.6	751.2	674.3	692.3	547.9	377.4	652.1
Auto Theft	157.7	156.1	122.2	114.1	82.6	61.0	128.8

The prominent position occupied by larceny in the foregoing table, and the gradual rise in the frequency of this crime during the past decade, invite a further breakdown of the total figures. The following brief tabulation shows a distribution of the value of property involved in larcenies, (not including auto thefts), during the first three quarters of 1939, as compared with the corresponding period of 1938:

Value of Property Stolen	Per Cent of Total Larcenies	
	1939	1938
Over \$50.00	11.8	13
\$5.00 and under \$50.00	64.9	65
Under \$5.00	23.3	22

The proportion of stolen property which was subsequently recovered, showed an increase during 1939. During the first three quarters of that year, 67.2% of the stolen property (in value) was recovered, as compared with 63.6% in the corresponding period of 1938, and 64.6% in 1937. A similar rise was shown with respect to the recovery of stolen cars. The number of cars recovered in 1937 and 1938 represented 93.5% of the number stolen. In 1939 the figure reached 96.0%.

Rural Crime.—Although the rural crime reporting area is much less developed than that for cities, towns, and villages, current data are collected in sufficient volume to justify the generalization that rural crime rates are lower than those of urban communities. Thus the direct relationship between population density and crime frequency, as noted above for urban places, is extended to rural areas as well.

But although all crimes are generally less frequent in rural than in urban areas, crimes against the person are relatively more frequent in the country. The relative standings for each class of reportable offence in 1938 are given below in terms of average groups of 100 urban and 100 rural crimes:

Offences against Property	Per Cent		Offences against the Person	Per Cent	
	Urban	Rural		Urban	Rural
Larceny	56.6	47.6	Aggravated assault	3.0	5.6
Burglary	22.7	29.9	Rape	.6	2.3
Auto theft	12.5	8.6	Murder	.3	1.4
Robbery	4.0	3.5	Manslaughter	.3	1.1

Similar urban-rural ratios are recorded annually in the United States, and have repeatedly been observed by commentators upon crime in Europe. The relative preponderance of rural murders, manslaughters, and rapes, as shown in the foregoing table, is especially pronounced. (See also CHICAGO; CRIME DETECTION; FEDERAL BUREAU OF INVESTIGATION; JUVENILE DELINQUENCY; POLICE.)

BIBLIOGRAPHY.—*Uniform Crime Reports* (quarterly) for 1938, and for the first three quarters of 1939 (Federal Bureau of Investigation, Washington); "Prisoners in State and Federal Prisons and Reformatories, 1937" (U.S. Bureau of the Census, 1939); "Judicial Criminal Statistics, 1937" (U.S. Bureau of the Census, 1939). (Br. S.)

Great Britain.—In 1937, the latest year for which complete statistics are available, the number of persons found guilty of offences of all kinds in Great Britain rose to 805,336, of which no fewer than 60% were for traffic offences; under 10% were in respect of indictable offences (i.e., crimes), the remainder being non-indictable cases, including drunkenness (showing a rise to 52,425), betting, and offences against by-laws and police regulations. The daily average prison population was 10,562 (in 1938, 11,086).

Of the 77,529 persons found guilty of indictable offences, about one-half were adults (over 21); in the great majority of cases the charge was theft or fraud, 77% of these being in respect of property valued at under £5 and only 1% at over £100. Only 5% of the total were guilty of sexual offences or acts of violence against the person, among the latter being 78 cases of murder of 87 persons—the lowest since 1930. In 27 of these the murderer or suspect committed suicide, in one, he died through injuries received at the time of the murder, in two, he escaped, and in the remaining 48, arrests were made. Nine thousand, eight hundred and eighty-one persons were found guilty of "breaking and entering;" of these 39% were children under 14 and over 75% were under 21. Juvenile crime generally was on the increase; but most persons found guilty of indictable offences are casual offenders, and the "old lag," for whom crime is a livelihood, is becoming scarce.

In 1939, though figures are not complete, there was a considerable increase of indictable crime of a serious nature, attributable partly to the activities of the I.R.A. (Irish Republican Army), whose bomb outrages, in many provincial centres as well as in London, were met by the Prevention of Violence (Temporary Provisions) Act, passed in July. The "black-out" and the heavy call on the police to provide personnel for other essential services, as in air raid precautions, did not, as might have been expected, occasion any marked increase in petty crime in the early months of the war. In Sept. and Oct. 1939 the total number of crimes (mostly small thefts) in the Metropolitan area was 12,283 as

against 16,023 in 1938, cases of "breaking and entering" falling from 2,171 to 1,503 and of bag-snatching from 66 to 53. In the three months, Sept.-Nov., while larcenies from the person rose from 90 to 99 and thefts of bicycles by some 35%, house breaking and burglaries fell from 1,461 to 1,153. (L. H. D.)

Crime Detection. So that every phase of criminal investigation can be aided by scientific methods, groups of technicians equipped with laboratories are now employed by many law-enforcement agencies. Among the technicians employed are those who apply the science of physics to such problems as the identification of firearms and the determination of trajectory and force of projectiles. Like most of the technicians in the field of crime detection, they find the microscope and camera indispensable.

The chemist or toxicologist is called upon for such things as identifying poisons and stains, detecting unburned nitrates on the hand of an individual suspected of firing a gun, restoring serial numbers effaced from automobiles or firearms, and identifying and comparing innumerable substances that may assist in apprehending a criminal.

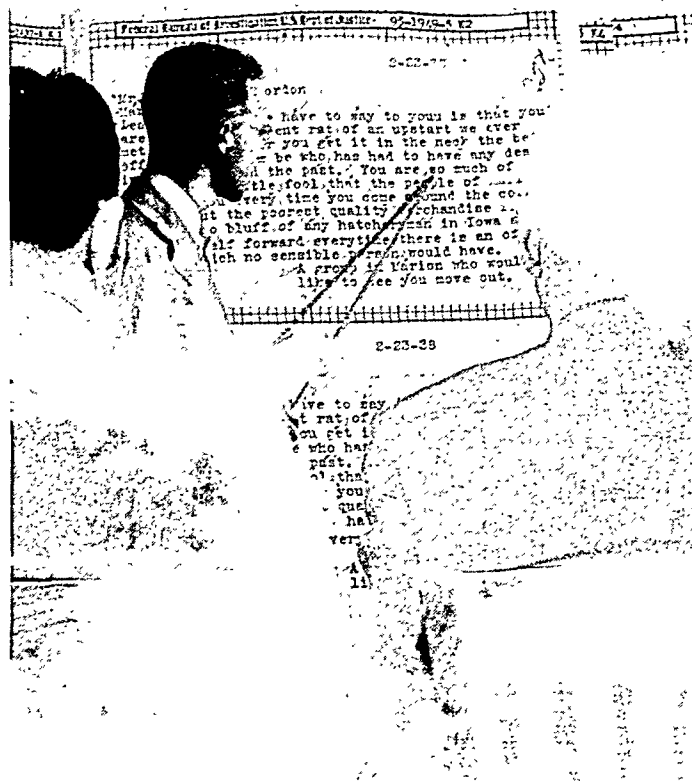
The examiner of questioned documents studies a variety of features of handwritings, typewritings, inks, papers, and other types and materials of writings for the purpose of solving problems of identification, sequence, and age. In examining wills, notes, checks, ballots, letters, and various documents, this technician employs microscopy, photography, and chemistry, as well as infrared and ultra-violet lamps and other scientific devices and procedures.

Biologists, botanists, geologists and metallurgists furnish invaluable aid in identifying or comparing substances discovered at the scene of a crime with material incriminatingly associated with a suspect. Physicians and pathologists are essential artisans in crime detection, for it is they who determine causes and times of deaths, the nature of injuries and suspicious illnesses. Psychologists and psychiatrists are consulted with increasing frequency for the purpose of determining the mental conditions of suspects and witnesses.

Prior to 1930 only the Police Department of Berkeley, Calif., employed a Polygraph (lie-detector). In 1939, 37 law enforcement agencies were given deception tests with an accompanying decrease in third-degree brutality. Banks, department and chain stores, and many other business institutions are employing the services of Polygraph operators to detect and prevent losses. Some organizations have all applicants examined as a means of determining their integrity.

Traffic studies and application of scientific methods of controlling traffic and preventing accidents constitute one of the most important of 1939 police-science contributions. Police are gathering evidence at accident scenes by the use of photography and the application of other scientific procedures. Chemical tests to determine intoxication were adopted by more than a score of departments during the year. The assignment of traffic patrolmen on the basis of accident records rather than by guesswork gained wide acceptance. Through pioneering efforts of outstanding police executives and university authorities, scientific procedures in all branches of police service have been adopted and advanced. (See also FEDERAL BUREAU OF INVESTIGATION.) (L. KE.)

Cristea, Miron (1868-1939), Rumanian patriarch and, at the time of his death, premier of Rumania, was born on July 20, the son of a Transylvanian farmer. After his consecration as bishop of Caransebes in 1899 he rose rapidly in the hierarchy of the Rumanian Greek Orthodox church until



IDENTIFICATION OF TYPEWRITER TYPE demonstrated at the annual re-training session of the Federal Bureau of Investigation in July 1939

he became Metropolitan primate in 1919. As patriarch after Feb. 1925, he was the spiritual ruler of the church's 13,000,000 communicants and a powerful influence in the nation's politics. Upon the death of King Ferdinand in July 1927, he became one of the triumvirate which ruled the country during the minority of Michael, until Carol returned from exile and seized the throne in 1930. Cristea was strongly opposed to a concordat with the Roman Catholic church, but as one of the regents he was obliged to sign the agreement after the Rumanian senate had approved it in 1929. During this period he publicly deplored all anti-Semitic activities—an attitude which he reversed ten years later when he became premier. Octavian Goga, his nephew, resigned as premier on Feb. 11, 1938, and Cristea was asked by King Carol to succeed him.

Cristea continued his predecessor's harsh measures against the Jews, though in considerably more diluted form; also under his Government the fascists led by Codreanu were ruthlessly suppressed.

Cristea died March 6 at Cannes, on the French Riviera.

Crop Control: see UNITED STATES: *The Farm Problem.*

Crop Insurance. An estimated production of 64,000,000bu. of wheat on 6,600,000ac. was insured in 1939 by the Federal Crop Insurance Corporation in the first governmental wheat crop insurance. Wheat growers in 30 States paid premiums in wheat or cash equivalent totalling 6,769,120bu. of wheat for 108,500 policies on winter wheat and 47,300 policies on spring wheat. Applications for policies were made by 205,000 growers in 22 winter wheat States and 100,000 growers in eight spring wheat States. Policies were issued, however, only on the payment of premiums in wheat or cash equivalent. Policies did not insure the price a farmer would receive, but insured only that he would receive in wheat 75% of an average crop. Payment of indemnities was in wheat or cash equivalent and amounted to 9,461,730bu., a loss of 2,691,610bu. or cash equivalent of about \$1,800,000 for the Government insurance corporation. Ninety-nine per cent of the farmers buying policies paid premiums in cash, which the insurance corporation converted into a reserve of wheat. For the 1940 wheat insurance program a more decentralized administration is contemplated and effort was made to

make the basis of averages more accurate, especially for States that recently suffered from recurrent droughts. Research is now being made by the Department of Agriculture, with a view of extending crop insurance to cotton, as suggested by the Federal Crop Insurance Act. The department's Bureau of Agricultural Economics has submitted a cotton crop insurance plan similar to that for wheat. (See House Document No. 277 of the 76th Congress, first session, which contains the bureau's report.) In its Aug. 26, 1939, number *Wallace's Farmer and Iowa Homestead* reported the results of an Iowa survey made by that farm magazine on the subject of crop insurance for corn. Farm owner-operators favouring corn crop insurance amounted to 51% in 1939 and 46% in 1938. Renters to the extent of 59% favoured such insurance in 1939 while 48% favoured it in 1938. (S. O. R.)

Crosley, Walter Selwyn (1871-1939), U.S. rear admiral, was born at East Jaffrey, N.H., on October 30. He was appointed to the U.S. Naval academy in 1889, received his commission as ensign in 1895. For bravery in action during the battle of Nipa Bay, Cuba, in 1898, he was advanced two numbers in rank. He saw service also in the Brazilian revolution of 1893, the Philippine insurrection of 1900, the West Indian campaign, the Haitian occupation of 1915, and the Dominican occupation of 1916. From 1910 to 1912 he was naval attaché at Constantinople and during the World War was attaché first at Petrograd, then at Madrid. In Nov. 1925 he was appointed U.S. Navy hydrographer, in which position he directed important surveys of Caribbean and other waters. He died at Baltimore January 6.

Cruisers: see NAVIES OF THE WORLD.

Cryolite. The only known commercial deposit of cryolite in the world is at Ivigtut, Greenland. Shipments in 1938 dropped 15% from 1937 to 44,000 metric tons, 23,000 tons to Denmark and 21,000 tons to the United States. In some years shipments have been made direct to Canada, but in general the Canadian demand is supplied by re-export from the United States, while Denmark supplies the rest of the world. Since cryolite is a necessary ingredient in the electrolytic bath for the production of aluminium, countries producing this metal are the chief consumers of cryolite, with the United States heading the list. Cryolite is also used in the manufacture of opaque glass, and small amounts are used in enamels, glazes, and insecticides. During recent years some manufactured cryolite has been used in the place of the natural product. (G. A. Ro.)

Cuba, a republic occupying the largest of the West Indian islands; language, Spanish; capital, Havana; president, Federico Laredo Bru; area, 41,634 sq.mi. excluding small neighbouring islands. Population (census, 1931) 3,962,344; (estimate, 1936) 4,108,650, including about 68% whites. The chief cities (with 1930 populations) are: Havana, 542,522; Santiago, 103,525; Cienfuegos, 87,699. The United States has a leased naval base at strategic Guantánamo bay.

History.—Cuba is under constitutional Government, with an elected president and bicameral congress. Since 1933, however, the personal prestige and political power of Colonel Fulgencio Batista, Chief of Staff of the Constitutional Army of Cuba, has been such that he has dominated the country, ruling it extra-constitutionally through the regularly elected officials. Growing dissatisfaction over the policies of the present administration, however, augmented by the badly depressed economic situation, caused the power of Colonel Batista to wane. He suffered the worst defeat of his political career in the November 15 elec-

tion of the Constituent Assembly, which met in December to begin drafting a new constitution. The Government parties elected 35 of the 76 delegates, while the opposition elected 41. Nevertheless, Colonel Batista gained prestige from one feature of the election, for general praise was given him, even by his opponents, for the honesty and fairness with which the Assembly election was conducted. The status of the Assembly from the legal standpoint was vague. Government adherents insisted that it had power only to approve a new constitution, while the opposition claimed that it represented the will of the people and should be the sovereign and supreme power in the nation in the period of its functioning. Further indications that Colonel Batista was losing popularity were seen by some in the reception accorded him upon his return from a good-will tour made to Mexico in February. There was a marked difference between the reception upon this occasion and the enthusiastic reception accorded him upon returning from his trip to the United States in 1938.

Uncertainties over the presidential elections in Feb. 1940, and the part Colonel Batista would play in them, were set at rest early in December, when he resigned as *Minister of War* and formally announced his candidacy for the presidency. He was nominated by five political parties, which united for the purpose as "The Social Democratic Coalition."

President Laredo Bru, on January 25, asked Congress to draft legislation to terminate the mortgage moratorium and to scale down all indebtedness. The bill drawn up, and known as the Mortgage Revalorization Law, provided that indebtedness contracted prior to 1931 should be reduced by 50% and debts contracted between that date and Jan. 1, 1933 should be reduced by 20%, and granted long repayment periods at low interest. The bill had the full support of Colonel Batista, but various groups made vigorous protests against the bill, charging that its passage would result in the destruction of Cuban credit, emigration of capital, paralysis of business, and the stoppage of further investments in Cuba. With such strong opposition evident, the President vetoed the bill.

Two trade treaties were ratified by the Senate in January. A treaty with Italy gave advantages to certain Cuban products in return for most-favoured-nation treatment with the exception of the United States. A similar "most-favoured-nation" treaty was made with Portugal.

Following the general plan of social improvement formulated by the Government, legislation was passed which provided for the regulation and control of rentals of dwelling houses. To compensate the landlords, new tax exemptions were laid down by the law.

In March, a day apart, died ex-President General Gerardo Machado and his successor, Carlos Manuel de Céspedes. Machado died in exile in the United States while Céspedes died in Havana.

The comic weekly *Zigzag* and the newspaper *La Prensa* were suppressed for causing the displeasure of Government officials. President Laredo Bru, however, signed a decree annulling the suppressions after the Supreme Court had held the action to be unconstitutional. When the German steamship "St. Louis" arrived in Cuban waters in May and attempted to discharge 907 Jewish refugees from Germany, the boat was refused permission to land its passengers on the ground their papers were not in order. President Laredo Bru ordered the ship to leave immediately, but fear of suicides among the despairing refugees caused the President to grant conditional permission to land the hapless people on the Isle of Pines, where they might stay in a temporary concentration camp. The decision came too late, however, as the ship had already begun the return trip to Germany, having found no other place at which it could discharge its passengers.

Upon the outbreak of the European war, President Laredo Bru issued a proclamation declaring that Cuba would maintain strict neutrality. The Government declared itself favourable to any

plan for collective neutrality of the Western Hemisphere. Later, the President asked Congress to grant him special emergency powers to cope with the problems resulting from the hostilities in Europe. Upon the Russian invasion of Finland in December, Cuba formally protested and expressed her sympathy for Finland.

A new tax law providing for the first income tax in the history of Cuba, and increasing a number of other taxes, was passed by both houses of Congress and sent to the President for consideration. Charges of profiteering by raising the prices of prime necessities were filed against a number of Spanish, Cuban, and Chinese merchants. To forestall any recurrences of such attempts, President Laredo Bru signed a decree September 9, setting maximum prices for certain essential foodstuffs.

Education.—During the 1937-38 school year 4,115 school-houses, with more than 8,300 classrooms, were in use as primary schools. The total enrolment was 423,420. It was estimated, however, that 4,000 more classrooms were needed to meet the educational demands of the country. Approximately 40,000 lunches and 30,000 breakfasts were served daily to needy children by the department of education. Reorganization of the 211-year-old University of Havana continued during 1939.

Army and Navy.—The Cuban Army numbers 15,000 men and officers, the rural guard 6,000. The navy includes 16 ships. Both army and navy have air services.

Finances and Banking.—The monetary unit is the peso, theoretically equivalent to the United States dollar. During 1939 its value declined and in December it was selling at a discount of approximately 10%. The budget for 1940 calls for \$75,992,000. The public debt as of Feb. 28, 1939, was \$141,278,000.

Trade and Communication.—Cuba has numerous good ports and regular, frequent external communication by steamship, with daily service from Key West, Florida. It is on the main route of the Pan American Airways, and enjoys excellent external as well as internal air transport facilities. Land communication is provided by a railway system (3,850 mi., including 250 mi. electric), based on an east-west trunk line, and by a highway network (2,500 mi. of improved roads), dominated by the 706-mi. Central highway, which runs the length of the island from Havana to Santiago. Telephone and telegraph facilities, with 52,740 telephones and 10,939 mi. of telegraph lines, are superior to those of any other Hispanic American country. There are 54 radio broadcasting stations in Cuba.

In 1938, imports totalled \$106,007,000, while exports totalled \$142,678,000, a favourable balance of \$36,671,000, and represented declines of 18.2% and 23.3% respectively. Approximately 76% of the exports were to the United States which, in turn, provided 70.9% of the imports. Great Britain was second in Cuban trade, providing 4.2% of the imports, and taking 13.8% of the exports. For the first time in many years Germany replaced Great Britain as the second largest source of Cuban imports.

The principal characteristic of Cuban exports in 1938, when compared with 1937, was a severe decrease in value but only a slight decline in volume. This was true, not only for the leading export commodity, sugar, but for virtually all the leading exports. In 1938, the shipments of raw sugar dropped only 2.3% in volume, but fell 21.4% in value; refined sugar exports declined 4.2% in volume and 22.6% in value. Raw sugar was exported to the extent of 2,587,945 tons valued at \$104,845,000, while 358,011 tons of refined sugar valued at \$22,441,000 were exported. The outbreak of the European war was momentarily cheering in some respects as it was felt that the result would be an increase in the exportation of sugar and an increase in its value, inasmuch as a large portion of European consumption is derived, normally, from the countries of Central and Eastern Europe. Moreover, Cuban sugar requires less time in transit to Great Britain than that from

most of the sugar-producing regions of the British Empire, including the Lesser Antilles. Presumptive increase in demand for Cuban sugar initially gave rise to great optimism in Cuba, with expectation of strong advances in price in the event of prolonged war. So, too, did the sugar panic of Sept. 1939 in the United States. Although seemingly of benefit to Cuba, the lifting of sugar quotas by the United States in September had an adverse effect, for under the reciprocal trade agreement between the United States and Cuba, the United States import duty was automatically raised from 90¢ to \$1.50 per 100 pounds. Consequently, such shortage as existed in the United States was filled largely from United States possessions and territories, as Puerto Rico, the Virgin Islands, and Hawaii, and Cuban sugar producers began to lose their principal market. Throughout the last months of 1939, the Cuban Government sought to reach some *modus vivendi* under which the lower tariff rate of the United States could be restored.

Tobacco is the export of second importance. Imports are foodstuffs, textiles, machinery, and other manufactured items. Tourist traffic to Cuba in 1938 comprised 158,013 tourists and excursionists, a smaller number than the record high of 178,396, set in 1937, but greater than the number arriving in 1936.

Agriculture and Mineral Production.—Cuba is primarily agricultural, with sugar, above all, and tobacco the outstanding crops, but intensive efforts at further diversification are being made by the Government. Overproduction of sugar resulted in an international agreement to restrict its production and the quota granted Cuba for 1939 was 2,696,517 long tons (2,240 lb.), that for 1938 was 2,950,000 long tons. All but 150,000 tons for local consumption were for export. The quota granted to Cuba by the United States for 1939 was 1,720,607 long tons, an increase over the 1,663,554 tons allowed in 1938. Coffee is increasing in importance, with 152,460 ac. planted, and an estimated production of over 71,000,000 pounds. To permit Cuban coffee to compete in foreign markets on equal terms with that of other countries an export subsidy is given. The exportation of fresh fruits and vegetables, principally tomatoes, was almost 21% less for 1938-39 than for the 1937-38 shipping season. From Nov. 1938, to May 1939, 62,039,546 lb. of fresh vegetables were shipped to the United States via the port of Havana. Cuba has valuable but undeveloped iron, oil, gold, and other mineral resources. Cuba produced \$136,126 in gold in 1938 as compared to \$37,660 in 1937, an increase of 262%. Further increases are not expected as the Congress failed to pass favourable mining laws. (See also WEST INDIES.)

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Curaçao, a colony of the Netherlands, including the islands of Curaçao, Aruba, and Saba, St. Eustatius, and St. Martin off the coast of Venezuela. Language: officially Dutch. Capital: Willemstad (pop. 27,231). The area of Curaçao is 212 sq. mi.; of the entire colony 436 square miles. Population (1937 official estimate), 94,945, with 60,883 on Curaçao, and 23,719 on Aruba. The colony is administered by an appointed governor and partially elected council. Upon the outbreak of European war in Sept. 1939, Curaçao became the haven of a number of German vessels. To protect the colony, the Netherlands Government took extensive precautions to insure safety against air raids, appropriating 2,000,000 florins for anti-aircraft defences. In 1937, the latest year for which statistics are public, imports aggregated 297,286,309 florins in value, a 50.8% increase (Venezuela, 75.4%; the United States, 12.8%; Colombia, 3.4%; and the Netherlands, 3%). Crude oil (principally from Venezuela) represented over 90%. Exports (1937) aggregated 269,943,953 florins, of which

petroleum and its derivatives represented 99½%, chiefly to Great Britain (32.8%), the Netherlands (10.2%), and the United States (12.1%), with 5,088,886 florins value in oil products to ships. Oil-refining is the chief industry, although Willemstad is assuming increasing importance as a transshipment point for cargoes bound for shallow ports in Venezuela. Phosphate production is likewise important, with exports valued at 873,404 florins in 1937. The monetary unit is the Netherlands florin (value: approx. 53.5¢ U.S.). The colony (1937) had 49 schools, mostly parochial, with total enrolment of 13,457. The population is over 75% Roman Catholic. (See also WEST INDIES.) (L. W. BE.)

Currency: see EXCHANGE RATES.

Cushing, Harvey (1869–1939), American surgeon and neurologist, was born in Cleveland, Ohio on April 8. He graduated from Yale in 1891 then went to Harvard, where he received his master's degree and his medical degree in 1895. In that year also he began the practice of surgery, and in 1902 he was appointed associate professor of surgery at Johns Hopkins medical school in Baltimore. Ten years later he was named professor of surgery at Harvard medical school and surgeon-in-chief of the Peter Bent Brigham hospital in Boston, both of which positions he occupied until his retirement in 1932. In the early days of the World War (1914–18) he joined an ambulance service in France, served later with the British Expeditionary Force, and directed U.S.A. Base hospital No. 5. For these services he received the American Distinguished Service medal. In 1923 he was president of the American Neurological Association and of the American College of Surgeons. In 1933 he became the first Sterling professor of Neurology at Yale's school of medicine. Dr. Cushing was the world's foremost authority on surgery of the brain. He developed the technique of operating with local anaesthesia, was one of the first to recognize the importance of the X-ray in medical treatment, pioneered the study of the basal metabolic rate, and was the first to employ blood pressure determinations in the United States (1901). He was likewise internationally known for his studies in endocrinology, and his monograph, *The Pituitary Body and Its Disorders* (1912) is a classic in the literature of clinical medicine. His *The Life of Sir William Osler*, published in 1925, was awarded the Pulitzer prize as the best American biography of that year. Dr. Cushing, whose daughter Betsey married James Roosevelt, eldest son of President Roosevelt, died at New Haven, Conn. on October 7. See also *Encyclopaedia Britannica*, vol. 6, p. 902.

Cycling. Arie Van Vliet of the Netherlands was the only world champion to retain his title in cycling during 1939. He kept his world professional sprint championship by default after he and Josef Scherens of Belgium had reached the final of the competition at Milan, Italy.

In the heat to decide the championship, Scherens was injured and thus the title stayed with Van Vliet automatically.

War activities compelled the abandonment of many cycling events, among them those designed to produce the professional motor-paced and professional road champions. Thus the above-mentioned sprint crown was the only world professional championship contested for during the year. The world amateur sprint honours went to Jan Derkens of the Netherlands, who succeeded his countryman, Jan van der Vyver. George Shipman of Brooklyn took the national professional sprint crown, and Tino Reboli, Newark, retained the national professional motor-paced championship. The national amateur sprint laurels were won by Howard Rupprecht of Maplewood, N.J., Robert Stauffacher of San

Francisco took the national A.A.U. senior crown, and Eddie Carafagnini became the National Cycling Association senior champion.

Despite the fact that the war situation curtailed certain international cycling events, there was an obvious upswing in cycling in the United States during 1939. The leading bicycle manufacturers reported tremendous advances in sales and predicted for cycling a return to its halcyon days around the turn of the century.

In New York, and in other progressive cities in the United States, city governments appropriated a total of well over several million dollars to be used to construct bicycle paths along popular highways and in the city parks. Several leading hotels opened bicycle bars to meet the growing popularity of the sport. (T. J. D.)

Cyclotron: see MEDICINE: *Medical Apparatus*; PHYSICS.

Cyprus: see BRITISH POSSESSIONS IN MEDITERRANEAN.

Czecho-Slovakia, a republic of Central Europe, had on Jan. 1, 1939, an area of 38,189 square miles. The population in this area amounted according to the census of Dec. 1930 to 9,807,096. The area was divided into three parts. The most western part, inhabited by a very large Czech majority, with a negligible minority of Germans living nowhere in compact settlements, consisted of Bohemia with an area of 12,525 sq.mi. and a population (always according to the census of 1930) of 4,472,354, and of Moravia with an area of 6,533 sq.mi. and a population of 3,332,522. Farther to the east, less densely populated and backward in its economic, social, and cultural life, was Slovakia, with a very large majority of Slovak inhabitants and small minorities of Hungarians and Germans. Its area amounted to 14,848 sq.mi., its population to 2,450,096. The most eastern part of the republic, at the same time the least densely populated and most backward one, was Carpatho-Ukraine or Ruthenia, the large majority of whose inhabitants were Ukrainians, sometimes called Ruthenians. Its area was 4,283 sq.mi., its population 552,124. The three peoples, the Czechs, the Slovaks, and the Ruthenians, were all three Slav peoples; the Czechs and the Slovaks most closely related and speaking and writing languages not more differentiated than dialects. The capital of the whole republic and of Bohemia and Moravia was Prague (Praha), the largest city,



VLADIMIR HURBAN, Czech minister to the U.S.A., refused to relinquish his legation to Nazi diplomats after Germany had absorbed his country on Mar. 15 and 16, 1939

situated in the centre of Bohemia. The capital of Slovakia was Bratislava, the capital of Ruthenia was Hust. Brno, the capital of Moravia, was the second largest city of the republic.

Czechoslovakia, as founded in 1918 as the result of a long struggle for independence of the Czech and the Slovak peoples, and of the victory of the democratic nations over the Central European empires, had undergone a profound change in the fall of 1938 as the result of the Pact of Munich and ensuing events. Czechoslovakia lost 16,056 sq.mi. of her territory with a population of 4,922,440. Of this area 11,071 sq.mi. with a population of 3,653,292 went to Germany; 4,566 sq.mi. with a population of 1,027,450 to Hungary, and finally 419 sq.mi. with a population of 241,698 to Poland. The name of the republic was changed to Czecho-Slovakia, and its constitution was re-written so that it now consisted of three autonomous parts (Bohemia and Moravia, Slovakia, Carpatho-Ukraine), giving each of the three component peoples a large measure of autonomy. At the same time, under pressure of National Socialist Germany and as the result of the abandonment by the western democracies, the constitution of Czecho-Slovakia lost its formerly democratic character. The Czechs, who had been the outstanding democratic people in Central and Eastern Europe, the only people there with a long-lasting and vital intellectual democratic tradition, were forced to accept a semi-Fascist regime and to curtail many of the democratic liberties which they had previously enjoyed. These Fascist tendencies became even more pronounced in more backward Slovakia where the peasant masses had not been trained for a democracy previous to 1918. By the force of circumstances the new Czecho-Slovakia found herself following by the end of 1938 in the political, economic and cultural orbit of National Socialist Germany.

At the beginning of 1939 the Czecho-Slovak Government was headed by Dr. Emil Hacha who had been elected president of the Republic on Nov. 30, 1938, and by a cabinet with Rudolf Beran as prime minister and Dr. Frantisek Chvalkovsky as foreign secretary. The cabinet represented the party of National Unity which had been formed in the fall of 1938 as a party uniting all the rightist and centre parties of the former regime in a strong semi-Fascist organization. The former Social Democratic Party was allowed to organize itself into an opposition group called National Workers Party, joined by progressive liberals and moderate social democrats, the Communist Party having been dissolved and outlawed immediately at the beginning of the new regime. The Government was faced by the difficult task of economic adaptation to the new situation. The country had lost about one-third of her industries, and more than two-thirds of her coal mines. By the amputation of her frontiers, her system of communications had been entirely dislocated. Railway lines and motor roads had to be rebuilt according to the new geographic conditions.

Soon it became clear that the solution found at Munich had been in reality no solution at all. The Czechs had expected that after cession of all the territory inhabited by Germans, and in addition to that a very large number of Czechs had been transferred to Germany, they would find themselves in a homogeneous and consolidated state. But the German Government continued to interfere in the Czech internal affairs. It did it after Munich much more than before, and Czecho-Slovakia was helpless against this continuously growing pressure. The tiny German minority, still living in Czecho-Slovakia, demanded not only special privileges and the constitution of a practically independent state within the state, but also a decisive influence upon Czech cultural, economic, and political life. The German Government demanded more and more the complete subordination of the still nominally independent Czecho-Slovakia to the economic and strategic needs of Germany and a complete co-ordination of the cultural and political outlook of the Czechs with the principles regulating the life of



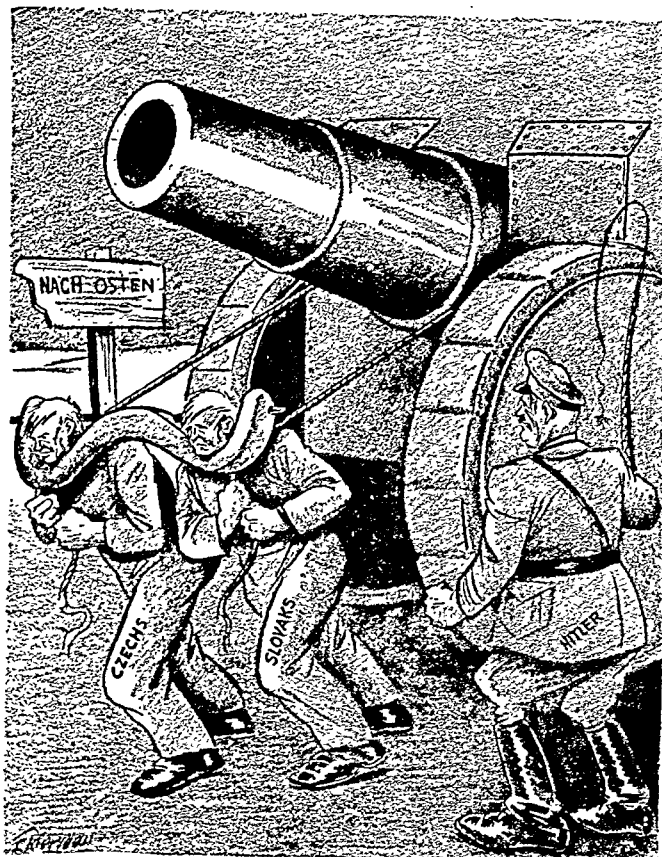
EMIL HACHA, ex-president of Czecho-Slovakia, inspected a guard of honour in Berlin Mar. 15, 1939, during his visit to Hitler which resulted in his nation's extinction

National Socialist Germany. Strategically and economically, the wisdom of the frontiers laid down for Bohemia and Moravia by the Treaty of Versailles became completely vindicated by the events and experiences after the Pact of Munich. The so-called Sudetenland had not only formed a historical and geographic unity with the remainder of Bohemia and Moravia, but had been proven to be entirely indispensable economically and strategically to Bohemia and Moravia if the 7,500,000 Czechs were to lead an independent existence and not to be subjected to German domination. Soon it became apparent that the compromise established in Munich to Germany's advantage was not to last, as German demands were growing fast in their insistence upon the complete subjugation of Czecho-Slovakia.

For that purpose the Germans promised their support to some extreme elements in Slovakia who wished to achieve the complete independence of Slovakia and to sever all connections with the Czechs. This group of pro-National Socialist Slovak extremists under the leadership of men like Dr. Bela Tuka, Sano Mach, and Dr. Ferdinand Durcansky, would have had no chance of success without the direct support of Germany. In a similar way Germany had promoted the pan-Ukrainian movement in Ruthenia. In face of these treasonable plots the Prague Government decided to take a strong stand, to dismiss some of the ministers who were guilty of plotting with Germany and to name in their place other men ready to work for the new constitution of Federal Czecho-Slovakia. The efforts of the Prague Government seemed successful at the beginning, but were soon thwarted by the open support given by Germany to the extremists in Slovakia. The German Government seized upon this opportunity to declare that Czecho-Slovakia had entered into a state of disintegration. At the same time the German radio broadcasted again, as in Sept. 1938, completely unfounded reports about Czech aggressive intentions against Germany and described alleged disorders and brutalities against Germans in Bohemia and Moravia. The president of Czecho-Slovakia was summoned to Berlin. There Dr. Hacha signed in the night of March 14 a document according to which he requested the establishment of a German Protectorate over Bohemia and Moravia. Of course Dr. Hacha was in no way authorized by the Czecho-Slovak constitution to sign such a document, even

if the signature had not been obtained under pressure. On March 15 German troops moved with great rapidity into Bohemia and Moravia and occupied the whole country. Chancellor Hitler himself came to Prague on March 15 and spent the night in the ancient castle of the Bohemian kings, the famous Hradčany. On March 16 Chancellor Hitler issued a lengthy proclamation according to which Czecho-Slovakia had ceased to exist. He asserted that by reason of their greatness and their qualities, the Germans alone were fitted to maintain peace in the lands of Czecho-Slovakia, a peace which, by the way, had not been threatened nor disturbed by anybody but the Germans. By this annexation of Czecho-Slovakia Chancellor Hitler broke all the promises and guarantees which he had given at Munich. Bohemia and Moravia were incorporated as a nominally autonomous Protectorate into the Reich. Only the inhabitants of German race became, however, citizens of the German Reich. The others remained subjects of the Protectorate and were regarded as inferior in their status to German citizens. The Czech army was disbanded, German troops remained in occupation of Bohemia and Moravia. The foreign affairs of the Czechs were to be conducted exclusively by Germany. Bohemia and Moravia became a part of the German customs territory, and Germany took also complete charge of all means of communication and transportation and of the postal, telegraph and telephone services. The German Government reserved the right to take over any part of the administration and to put into effect any measures which it deemed necessary for its own interests. At the head of the Protectorate was to remain an official, approved by the Reich, with the title Head of the State. Dr. Emil Hacha was allowed to continue in this position. He has at his side a cabinet whose members, however, can occupy the office only with the agreement of the Reich. The real power is in the hands of the Reichsprotector, appointed by Chancellor Hitler, and his staff. In the middle of March the other constituent parts of Czecho-Slovakia changed also their status. Slovakia had proclaimed her independence as a republic on March 14, 1939. The new state signed on March 18, 1939, in Vienna a treaty with Germany according to which Germany guaranteed for a period of 25 years the independence and the boundaries of Slovakia. For that purpose Germany received the right to construct military works and to garrison German troops in certain strategic portions of Slovakia. Slovakia was declared at liberty to join the German customs union. At the same time Ruthenia, which on March 14 had made an ephemeral effort at proclaiming its independence, was occupied by Hungarian troops and incorporated into Hungary, where the new province was granted a certain limited autonomy. Thus Czecho-Slovakia ceased to exist. Her conquest was, however, not recognized by the democratic powers, among them the United States, Great Britain and France. The diplomatic and consular representatives of Czecho-Slovakia continued to function in these countries. The occupation of Bohemia and Moravia by the German troops was also a turning point in the general history of 1939.

Those circles in the democratic countries which so far had believed in the possibility of an appeasement of Germany and had been responsible for the conclusion of the Pact of Munich, now began to realize that there was apparently no limit to Germany's aspirations and that she was bent upon the subjugation of non-Germanic peoples. The conquest of Czecho-Slovakia became thus the point of departure for a policy of checking further aggression. The European war which broke out as the result of this effort aroused in the Czechs and in the Slovaks the expectation that the hour of liberation may come for them again, and that Czecho-Slovak democracy and independence may be revived. At the beginning of 1940 the fate of Czecho-Slovakia, as the fate of the whole of western civilization, depended upon the outcome of the



"STILL UNITED." A grim footnote to the disappearance of Czecho-Slovakia in Mar. 1939; by Elderman of *The Washington Post*

war. The Czechs and Slovaks in the democratic nations organized themselves under a Czechoslovak National Committee headed by Dr. Edward Benes, to co-operate with the democracies in their fight for freedom.

(See also BOHEMIA AND MORAVIA; EUROPEAN WAR; FINANCIAL REVIEW: *Abroad*; LITTLE ENTENTE; MINORITIES; RUTHENIA; SLOVAKIA.)

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Dahomey: see FRENCH COLONIAL EMPIRE.

Dairying. The trend in dairy production and herds accelerated to such an extent in 1939 that by Jan. 1, 1940, preliminary estimates of the number of heifers being saved for milk cows reached 5,800,000, a new peak and about 3% larger than on Jan. 1, 1939. This is a much larger number than needed for normal replacements in dairy herds in 1940 and 1941, and indicates still further increase in production of dairy products. The size of herds will depend on the rate of culling old cows, which rate was high in 1939 since the price for beef was high as compared with prices for butterfat. The prices for manufactured dairy products were lower in the summer of 1939 than for any time since 1933. Widespread drought in the autumn months reduced the milk flow considerably. Abundance of feed grains, forage and feed by-products, together with more favourable weather in late autumn, reversed this situation so that 1939 milk production was reported at somewhat higher than the 107,000,000 lb. production of 1938, which was 4% higher than that of 1937.

With the outbreak of war in Europe in September prices for dairy products advanced in line with the rise in other commo-

ties and the increased industrial activity. Ice cream, fluid milk and butterfat are the dairy products most directly affected by increases or decreases in urban prosperity. (See MILK and BUTTER for data on Government loans to the Dairy Products Marketing Association to support the price of butter in July, 1939, and for activities of control boards in urban milk sheds.) The peak in the number of milk cows on farms was in 1934. Owing to the droughts of 1934 and 1936 and to low prices the trend was downward until 1938, which year marked an upturn that was continued through 1939 to the extent of possibly making a new peak in 1940. Stocks of dairy products in 1939 were considerably smaller than in 1938 so that a generally more favourable situation for production prevailed at the outbreak of war.

Regardless of a possibly increased war demand for dairy exports, the World War (1914-18) demonstrated that war in Europe lessened imports of dairy products, principally cheese and butter, very materially. Imports of dairy products, in terms of milk, were 780,000,000lb. in 1914 but were only one-fifth of that amount in 1918. During the World War, the U.S. Department of Agriculture reports, "with this decline in imports and the rapid expansion in exports the United States shifted from a net import of dairy products amounting to about 400,000,000lb. per year in the period 1910-14 to a net export of 2,100,000,000lb., milk equivalent, in 1918." See E. E. Vial, "The Dairy Outlook for 1940," *The Agricultural Situation*, Nov., 1939, U.S. Dept. of Agriculture, pp. 22-24. (See also BUTTER; CHEESE; MILK.)

(S. O. R.)

Dakar: see FRENCH COLONIAL EMPIRE.

Daladier, Edouard (1884-), French politician, of whom a biographical notice will be found in the *Encyclopædia Britannica*, vol. 6, p. 985. The son of a baker, he was educated at Lyons, was a school-teacher until the World War (1914-18), in which he served, retiring as a captain (*Croix de Guerre*, *Légion d'Honneur*). In 1919, he entered the chamber as a Radical-Socialist. Minister of war in 1925, president of the Radical Party since 1927, he formed in 1933 a ministry which lasted ten months, and then served under Sarraut and Chautemps. In 1934 he formed another Government which, as a result of the riots following the Stavisky scandal, lasted only a few days. Minister of war since 1936 in various *Front Populaire* Governments, in April 1938 he became prime minister.

He began the year 1939 with a tour of Corsica and the French North African colonies, calculated to show Italy that France had not the slightest thought of yielding to her neighbour's "justified demands." On March 18, after Germany's final dismemberment of Czecho-Slovakia, the chamber of deputies granted Daladier semi-dictatorial powers to rule by decree. After Mussolini's speech of March 26 in which he vaguely recommended that France should invite Italy to discuss the "problems" that divided the two nations (Tunisia, Jibuti and the Suez canal), Daladier called upon Il Duce, in an international broadcast, to declare his hand and clarify his demands; he repeated that France intended to yield not a square inch of her colonial empire. This speech was roundly applauded in France but drew no public answer from Mussolini. During the "war of nerves" that preceded the beginning of war in September, Daladier showed no signs of retreating from the strong position France and Britain had taken after the events of March. He merely reiterated his promise to march to the aid of Poland if that country were attacked, and on August 25 he reminded his countrymen that another surrender to force would leave France without friends and surrounded by enemies. Then he addressed an appeal to Hitler, as "an old front-fighter," not to resort to war. The day after Germany invaded Poland, the chamber of deputies

voted Daladier the implied right to declare war, which he did after Berlin refused to comply with the terms of the French-British ultimatums. On September 13 he formed a war cabinet and took over the portfolio of foreign affairs. Daladier paid scant attention to Hitler's proposals for peace and formally replied to the Fuehrer's speech of October 6 before the Reichstag by declaring that France would continue the war until she had certain guarantees of security.

Dalai Lama: see TIBET.

Dams. An increase of the activity of Governments throughout the world in the regulation and use of water is evidenced by the table on p. 197, which was condensed from a list of over 75 important dams recently completed or under construction in 1939.

The United States leads in this field with some of the largest dams. Grand Coulee, world's largest concrete dam, is more than 75% complete. The year's (1939) construction saw new concrete-placing records set as 20,684 cu.yd. went into the dam on May 25, to surpass the 15,844 cu.yd. set by the contractor for a 24-hr. period on the base of the dam in 1937. A new monthly record of 397,994 cu.yd. was established in August, only to be increased in September to 449,689 cubic yards.

The Central Valley project in California, with its two large dams, was the centre of attention. Shasta dam, second largest concrete dam in the world, was (Dec. 31, 1939) nearly ready for concrete pouring to commence, following extensive foundation excavation of over 3,000,000 cubic yards. The 28-ft. diversion tunnel has been completed and the Southern Pacific railroad has been temporarily routed through it. The final relocation of the railroad outside of the reservoir area requires 30mi. of new line, involving nearly 5,000,000 cu.yd. of grading, of which about 1,500,000 has been completed.

Construction of Friant dam, another large concrete structure for this project, was also started in 1939.

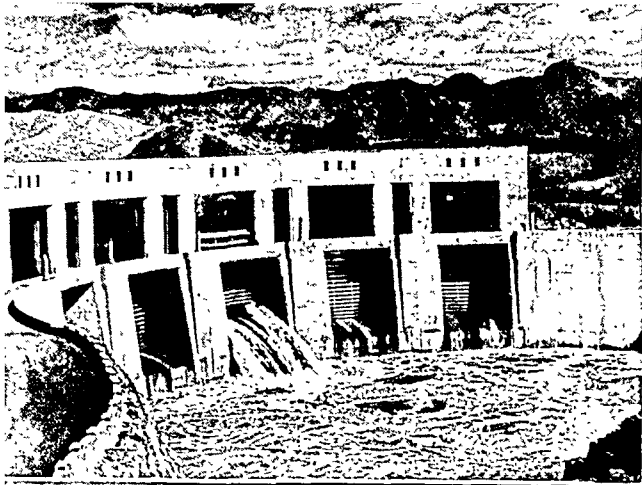
Investigations early in 1939 of the slide which occurred at Fort Peck dam Sept. 22, 1938, indicated that the weathered shale and bentonite seams in the foundation were too weak to hold up under the tremendous shearing force exerted by the dam. The situation was remedied by flattening the upstream slope of the dam. Although this change increased the total volume of earth required for the embankment by 22%, the placing of the hydraulic earth fill was completed. The remaining 25ft. of height will be built of rolled fill, taking the material needed from the downstream slope of the dam itself.

The Kingsley dam, second in size to Fort Peck, also being built by the hydraulic fill method, was in 1939 approximately 30% complete. The core pool was formed and the work proceeded at the average rate of about 300,000 cu.yd. of earth per week.

On the same river, the North Platte, the Seminole dam is already in service. At this site faulted areas were encountered under the dam and construction procedure necessitated cleaning out two large seams after the dam was partly built. Mining methods involving shafts, tunnels and drifts were used and the excavated material was replaced with concrete.

In Mexico, considerable progress was made on several large dams being built by the National Commission of Irrigation. A newly created body, the Federal Electric Power Commission of Mexico, has also started construction of a few small dams.

Conditions in Europe placed some restraint on dam building. In France, however, war needs lent impetus to hydro-electric developments such as the Genissiat project with its 330-ft.-high dam. This dam, under construction in 1939, is Europe's largest. In its proposal stage it attracted wide interest due to its similarity of



Above, left: PARKER DAM on the Colorado river, where the gigantic 242-mi. aqueduct to Southern California begins. This system of water supply, completed in 1939, is the largest in the world.

Above, right: BARTLETT DAM, largest multiple-arch dam in the world, was completed in May 1939 on the Verde river, Arizona

Left: ARCHITECT'S DRAWING of the projected Friant dam on the San Joaquin river, California

Below, left: CONCHAS DAM in New Mexico as it neared completion in Aug. 1939

Below, right: SEMINOLE DAM on the North Platte river, Wyo., completed in Aug. 1939, stores 1,020,000 ac.ft. of water for irrigation



Chief Dams Completed or Under Construction During 1939

Name of Dam	River	Place	Type	Maximum Height, Feet	Crest Length, Feet	Volume (cu. yds.)	Purpose*	Built by	Progress*
Bartlett	Verde	Arizona, U.S. . .	Concrete, multiple arch** . .	270	750	165,000	I	U.S. Reclamation Bureau . . .	C
Conchas	So. Canadian . .	New Mexico, U.S. .	Concrete, straight gravity . .	220	1,250	647,380	F, W, P	U.S. Army Engineers	C
Denison	Red	Texas, U.S. . . .	Earthfill	165	14,000	15,475,000	F, P	U.S. Army Engineers	U
El Azucar	San Juan	Mexico	Earthfill	142	18,900	5,677,031	I	Mexican National Commission of Irrigation	U
El Palmito	Nazas	Mexico	Earthfill	295	1,005	6,632,348	I, P	Mexican National Commission of Irrigation	U
Fort Peck	Missouri	Montana, U.S. . .	Earthfill, hydraulic	242	9,000	122,178,000	F, P	U.S. Army Engineers	U
Friant	San Joaquin . .	California, U.S. . .	Concrete, straight gravity . .	300	3,430	1,900,000	I	U.S. Reclamation Bureau . . .	U
Fuihodo	Yalu	Manchoukuo . . .	Concrete, straight gravity . .	208	2,730	3,530,000	P	Yalu River Hydro-Electric Co. .	U
Genissiat	Rhone	France	Concrete, straight gravity . .	330	650		N, P	Compagnie Nationale de Rhone .	U
Grand Coulee . .	Columbia	Washington, U.S. .	Concrete, straight gravity . .	550	4,300	10,200,000	I, F, P	U.S. Reclamation Bureau . . .	U
Green Mountain .	Blue	Colorado, U.S. . .	Earth and rockfill	270	1,300	4,400,000	I, P	U.S. Reclamation Bureau . . .	U
Hansen	Big Tjunga . . .	California, U.S. . .	Earthfill	110	9,050	13,300,000	F	U.S. Army Engineers	U
Haweswater . . .	Haweswater . . .	Westmoreland, Eng.	Concrete, hollow buttressed .	120	1,550	120,000	W	Manchester Corporation	U
Kingsley	North Platte . .	Nebraska, U.S. . .	Earthfill, hydraulic	162	11,000	26,000,000	I, P	Central Nebr. Public Power and Irrigation District	U
La Angostura . .	Bavispe	Mexico	Concrete Arch	291	515	175,871	I, P	Mexican National Commission of Irrigation	U
Marshall Ford . .	Colorado	Texas, U.S. . . .	Concrete, straight gravity . .	270	2,623	1,868,700	F, P	U.S. Reclamation Bureau . . .	U
Seminole	North Platte . .	Wyoming, U.S. . .	Concrete Arch	296	600	170,853	I, F, P	U.S. Reclamation Bureau . . .	U
Shasta	Sacramento . .	California, U.S. . .	Concrete, straight gravity . .	500	3,500	5,400,000	I, F, P	U.S. Reclamation Bureau . . .	U
Stevens	White	Washington, U.S. .	Earthfill**	425	700	3,000,000	F	U.S. Army Engineers	U
Winsor	Swift	Massachusetts, U.S.	Earthfill	170	2,640	4,000,000	W	Metropolitan Water District (Mass.)	C

*I=Irrigation, F=Flood control, P=Power, N=Navigation, W=Water supply, C=Completed in 1939, U=Under construction, **Highest in world.

location and arrangement to Boulder dam in the United States. It appeared to be almost an exact replica on a smaller scale.

Some changes were made in the plans, such as placing the power houses across the river at the base of the dam instead of parallel to the river along the base of the canyon walls as at Boulder, but the resemblance is still remarkable.

The accompanying table gives data on 20 of the more important dams completed or under construction during 1939. (See also IRRIGATION; WATER POWER.) (W. P. C.)

Dance. Social dancing in America, during 1939, responded markedly to international influences. Three well-defined forces are discernible; namely, English importations, Cuban importations, and the European war crisis. The widespread popularity of the Lambeth Walk, which reached its peak late in 1938, waned in the early months of the new year; but such was its success, if short-lived, that other English dances were imported in its wake. In quick succession followed the Palais Glide, the Chestnut Tree, and the Booms-a-Daisy, none of which enjoyed the popularity of the Lambeth Walk. The Chestnut Tree is a "game dance," calling for pantomime on the part of the participants. It is danced (performed would be a more descriptive word) to a syncopated version of the widely known English nursery rhyme. Since the dance depended upon the tune, a decline in popularity of the tune pre-determined a similar fate for the dance.

In the summer of 1939, Arthur Murray imported still another English dance, the Booms-a-Daisy. Unlike its predecessors, this was danced to waltz time; but it was similar in that it was danced to a single tune and performers were called on to act out movements called for in the lyric.

Introduction of these new dances caused no diminution in widespread use of the waltz and fox trot. Nor was there any diminution of "jitterbug" dancing among the younger set. The Big Apple, or more correctly, the various acrobatic steps which comprised the Big Apple, were no longer being danced; but lively steps, similar in spirit and vigour, were popular among the avowed "jitterbugs"—ardent enthusiasts of "swing" music.

As the year went into its third quarter and war crisis bulletins began to pour into the U.S., there was a noticeable increase in dancing. It was the first manifestation of the country's jittery nerves and vividly recalled the dance craze which flourished immediately before and immediately after the outbreak of the World War. Open air public dances were particularly popular in 1939 and, some weeks before the New York World's Fair closed, they were staged daily, proving a successful attraction. New ballrooms

were opened to accommodate large crowds of dancers and New York witnessed its first "danceteria" in operation, three floors devoted to dancing and located at 42nd st. and Broadway.

The opening of the fall social season quickly revealed a definite trend toward such dances of Cuban origin as the rhumba and the conga. The rhumba was by no means a new dance but whereas heretofore it had been confined to higher economic groups simply because only the more expensive night clubs could afford to hire a rhumba band, it had by the fall of 1939 broken out of its confines.

Virtually a newcomer to America, la conga became an overnight dance sensation. It was accepted eagerly by dancers everywhere because it is simpler than the rhumba in execution and requires less dexterity. Moreover, it is a group participation dance—the performers forming a "line," one arm outstretched and hand rest-

THE OLD-FASHIONED SQUARE DANCE returned to popularity in the United States in 1939





"THE CHEMICAL BALLET," produced by chemists of Johns Hopkins university April 4, 1939, before the annual meeting of the American Chemical Society at Baltimore

ing on shoulder of the person in front—which adds to the merri-
ment. The increasing popularity of the conga led to the creation
by Arthur Murray of a new dance, the "Americonga," a combina-
tion of the Virginia reel and the conga, designed to give an Ameri-
can flavour to the Cuban dance. Before the year was out, the
Americonga was already experiencing a vogue. (A. Mv.)

Folk Dancing.—The year 1939 marked a high point in the still
rising tide of interest and activity in the realm of folk dancing
throughout the western world. The outstanding event of the year
was the Third International Folk Dance Festival and Scientific
Congress held in Stockholm, Sweden, from August 1 to 6. Fifteen
nations, including the United States, sent either dance groups,
speakers, or both.

These great International festivals in Europe have dem-
onstrated how large a part the social type of folk dance is playing
in the life of each nation. In nearly every European country there
is an organization or movement devoted to nurturing the folk
tradition. Important among them, in eastern and central Europe,
are: *Gyöngyös Bokréta* or Pearly Bouquet in Hungary; *Hrvatski
Seljački Pokret* (Croatian Peasant Movement) and *Sklad* in
Yugoslavia; *Lyceon ton Hellenidon* (Lyceum of Greek Women)
in Greece; *Strajeri* in Rumania; and the *Théâtres Populaires* in

Poland. Important annual national festivals are held: for 12 days
in August in Budapest, Hungary; for the month of June in
Zagreb, Croatia; during May in Bucharest, Rumania; on August
4 at the stadium in Athens, Greece; and for a week in August in
the mountains in south Poland.

Since 1921, Denmark, Finland, Norway and Sweden have
united annually in a Nordic festival held alternately in the dif-
ferent countries. The societies guiding the dance movement in
these countries are as follows: for Denmark, Foreningen til
Folkedansens Fremme; for Finland, Suomen Kansantanshuliitto
and, also, Finland's *Svenska Folkdansring* for the Swedish speak-
ing group; for Norway, Noregs Ungdomslag; and for Sweden,
Svenska Ungdomsringen för Bygdekultur.

The English Folk Dance and Song Society holds a festival in
London every January which, in 1939, included groups from
seven other European countries. Scotland has its famous (High-
land) Braemar gathering in August.

The fostering folk societies in other European countries are as
follows: in Estonia, Ülemaaline Eesti Noorsoo Ühendus; in
Lithuania, a group at the University of Kaunas; in Italy, Opera
Nazionale Dopolavoro; in France, the Society of the Friends of
Popular Arts and the Musée National des Arts et Traditions
Populaires, Paris; in Germany, Reichs Gemeinschaft der Deut-
schen Volksforschung Abteilung Deutsche Volkskunde; and in
Switzerland, the Fédération Suisse des Costumes Nationaux. The
greatest of all Swiss dance festivals took place in August at the
National Exposition in Zurich.

Turning from Europe to the United States, 1939 finds a greater
number of people folk dancing than ever before in the history of
the country, and everywhere signs indicate continued increase.
This nation of many transplanted peoples is steadily growing
more appreciative of its folk inheritance.

Organizations of wide scope contributing to this expansion are
of greatly diversified character. Among them may be listed:
American Folk Dance Society, with headquarters in the Folk Arts
Center, New York, N.Y.; The English Folk Dance and Song
Society of America, with headquarters in New York, with affil-
iated centres in 12 cities, 11 additional affiliated groups, an annual
spring festival in New York and a summer school camp in Massa-
chusetts; National Folk Festival Association, holding its Sixth
Annual National Folk festival in Washington, D.C. in 1939; Folk
Festival Council in New York city, holding its eighth annual course
"Folk Dances and Songs of Many Peoples" at The New School
for Social Research; American Association for Health, Physical
Education, and Recreation, guiding the activity in schools and
colleges; National Recreation Association, conducting Institutes
throughout the country; Recreation Service of the Conference of
Southern Mountain Workers, holding its Fourth Annual Mountain
Folk festival in Berea, Kentucky; Co-operative Recreation Ser-
vice in Delaware, Ohio; Co-operative Society for Recreational
Education, conducting its Fourth Annual National School in Mill-
town, Wisconsin; Recreation Division of the Works Projects Ad-
ministration, co-ordinating and developing folk activity in many
States; Farm Bureaus, Granges, and 4-H Clubs; International
Institutes of the Y.W.C.A. and the National Institute of Immi-
grant Welfare, holding seasonal festivals and folk dance courses
in leading cities; International Houses of Berkeley, Calif., Chi-
cago, and New York; the American, Southeastern, and Texas
Folklore Societies; Camp Fire Girls; Girl Scouts of America;
Amalgamated Clothing Workers of America, with a department
of cultural activities serving a membership of nearly a quarter
million; and the Youth Hosteling movement with its chain of
hostels connecting 19 countries.

Additional noteworthy 1939 dance events include the Fifth
Festival of Nations of the International Institute, St. Paul, Minn.,

the Fourth Annual Dauphin County festival in Harrisburg, Pa., the Golden Gate Exposition festival in San Francisco, Calif., the Daily Mirror festival at the New York World's Fair, the Seventh Annual Folk festival in Vancouver, Canada, the Ninth Annual festival at the Traipsin' Woman's cabin, Kentucky, the Eighth Annual White Top festival on White Top mountain, Virginia, the 12th Annual Mountain festival in Asheville, North Carolina, and the 18th Annual Inter-Tribal Indian Ceremonial in Gallup, New Mexico; also, the year-round early American dance movement in the Detroit area conducted from Greenfield Village in Dearborn, Michigan. During the fall months of 1939, ground work was laid for the great Coronado Cuarto Centennial celebration of 1940 in New Mexico. (P. PA.)

Ballet, classic dance form and popular theatre art, felt the gathering war clouds of 1939 and suffered an almost complete black-out in Europe, its ancestral home, at the formal declaration in September, when many of its chief practitioners migrated to neutral United States, where receptivity has increased rapidly in the last few years, and a tendency to nationalize the art has steadily grown. In October, Massine's Ballet Russe arrived in New York with some difficulty, only in time to begin its fall season at the Metropolitan Opera House several weeks late.

Premières intended for the cancelled London season took place in New York: Massine's *Rouge et Noir* (Shostakovitch); Dali's surrealist *Bacchanale* (Wagner's "Venusberg" music); and Ashton's *Devil's Holiday*, scenario and score by Tommasini, on themes from Paganini. Massine's *Capriccio Espagnol* (Rimsky-Korsakoff) had its première in the spring season at Monte Carlo, with the Spanish dancer, Argentinita, collaborating in the choreography and creating the principal feminine role. The all-American *Ghost Town*, by Marc Platoff, was intended for American première in any case.

After a brilliant month in New York, this company began a five months' transcontinental tour. Massine, and other members, seeing no future for ballet in Europe for some time to come, took out citizenship papers, it is said. American dancers were added to the corps. Personnel of principals, with the exception of Panaieff at war, replaced by Eglevsky, remained as of previous season, i.e. Danilova, Markova, Slavenska, Krassovska, Theilade, Roudenko, Rostova, Youskevitch, Franklin, Zoritch, and the Americans, Platoff and Guerard.

Lichine of the former De Basil Ballet Russe, toured Australia with the division known as Educational Ballets, Ltd., then settled in Los Angeles, announcing that he was within one year of becoming an American citizen. Educational Ballets became known as the Covent Garden Russian Ballet during the London spring season, Colonel de Basil rejoining them as director. The company, now known as the Original Russian Ballet, Ltd., with almost the same personnel as last year and with De Basil as sole artistic director, sailed for Australia in December.

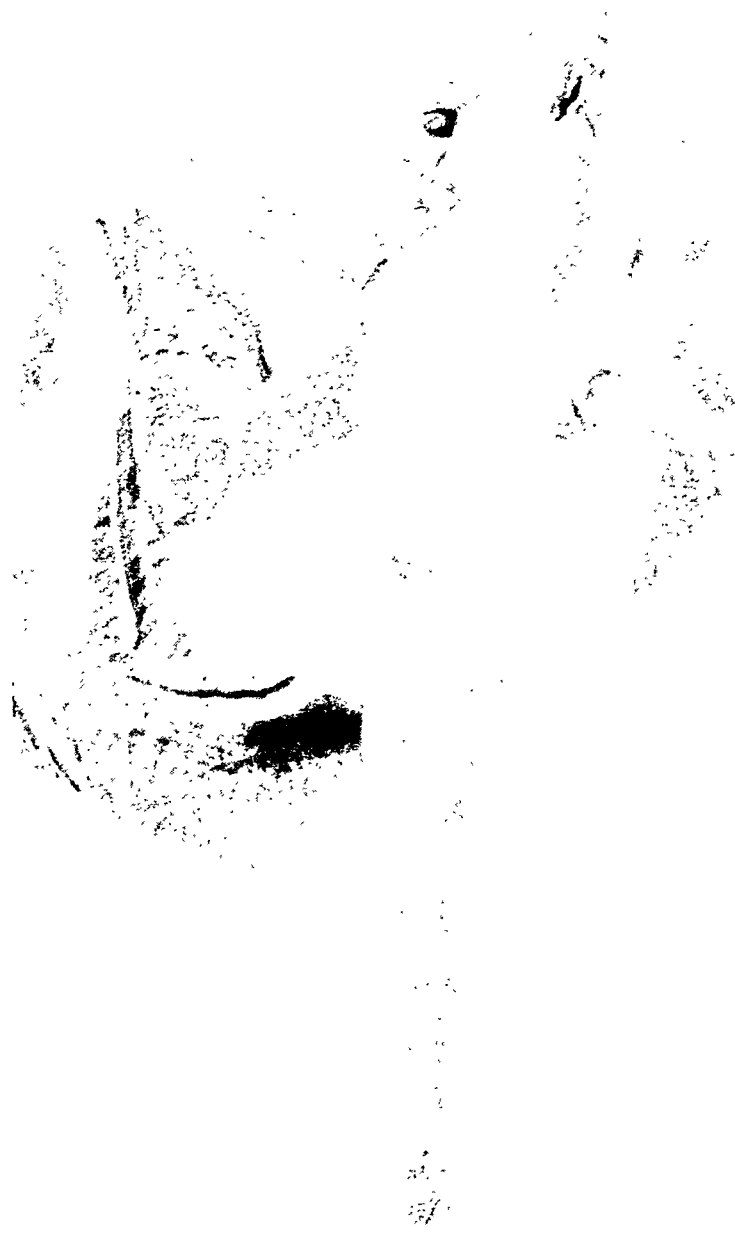
Living and working in California at least part of the year were Riabouchinska, Osato, Denisova, with Lichine; Baronova, making a motion picture sequence for M.G.M.; Verchinina, who rejoined De Basil's company for the London season; and Toumanova, who appeared in the stage musical, *Stars in Your Eyes*, in New York during the winter.

An ambitious new project of the fall season was the founding in New York of the Ballet Theater, an organization combining most of the big names outside of the active Russian companies. Three famous expatriates, long resident in the United States—Fokine, Bolm, and Mordkin—headed the list of choreographers. Added to a nucleus of Mordkin's company—Bowman, Conrad, Essen, Chase, Varkas and Romanoff, among the principals—were

the English visitors, Dolin, Tudor, Howard (dancers and choreographers), Laiing and Michael. For Americans, De Mille, Loring (on leave of absence from Kirstein's American Ballet Caravan) both dancers and choreographers, Gollner, Golden, Lyon, among others. Nijinska and Shabolevsky were later engaged. An elaborate program of new works, novelties and revivals, for the season opening Jan. 4, 1940, was announced.

The American Ballet Caravan started westward in October on its second transcontinental tour, with the new *City Portrait* (Loring) and *Charade* (Lew Christensen). The San Francisco Opera Ballet, directed by William Christensen, started eastward in November, playing engagements en route to Chicago. The Philadelphia Ballet returned for a second season at the Chicago City Opera. The Graff Ballet of Chicago made its first eastern tour.

The Polish Ballet, under Leon Woicikovsky, made a brief visit to the New York World's Fair, where the prospective dance season was otherwise voided by competing attractions and disturbed conditions in Europe. Thus the engagement of the Soviet Song and Dance Ensemble was cancelled.



TAMARA TOUMANOVA, formerly of the Ballet Russe, starred in the musical comedy *Stars in Your Eyes* which opened in New York city Feb. 9, 1939

In London, the Ballet Rambert carried on at the Mercury theater, in spite of war. The Vic-Wells Ballet, disbanding on the day war was declared, soon reassembled for a provincial tour, with tentative plans to carry on on a co-operative basis. The first performance of the Irish Ballet Production Society took place in Dublin in October.

The Ballets Jooss, intact as far as war was concerned, toured the British Isles in summer and early fall, with the new *Chronica* and *A Spring Tale*, reviving *The Green Table* by request after war began, and sailed for their fourth United States tour in December.

Trudi Schoop's Comic Ballet disbanded in the United States at the close of their tour in the spring, Trudi returning to Switzerland for a year's retirement, and several members of the company remaining in the United States.

Still the outstanding motion picture was *Ballerina*, starring Slavenska, Jean Benoit-Levy, director, which was made in France in 1938 and widely circulated in the United States in 1939. *On Your Toes*, with ballet background, and other Hollywood musicals, included ballet sequences. Experiments with ballet shorts and television continued without radical advancement. Ice ballets, on rink and screen, remained popular.

BIBLIOGRAPHY.—*The Book of Ballets, Classic and Modern*, edited by Gerald Goode, and profusely illustrated (1939); Arnold L. Haskell's *Balletoman's Album* (mostly pictures) (1939); Lincoln Kirstein's *Ballet Alphabet* (1939); and John Martin's *Introduction to the Dance* (1939). (M. L.)

Danish Literature: see SCANDINAVIAN LITERATURE.

Danzig, an important port on the Vistula river near the Baltic sea, was taken from Germany after the World War and created a free city—sovereign in some respects, controlled by Poland in others, and supervised by a high commissioner appointed by the League of Nations. Its area is 754 sq.mi. and its population 407,000, of whom 291,000 live in Danzig itself, the remainder in the surrounding rural districts. As Danzig had been under the Teutonic Knights from 1308 to 1454, under Poland from 1454 to 1793, and a part of Prussia from 1793 to 1919, it was furiously coveted by both Germany and Poland even after its establishment as a free city. Centuries-long emotional hatreds caused bitter German-Polish friction and constant appeals to the League of Nations for fifteen years after its separation from Germany.

With Hitler's coming into power in Germany in 1933 the conflict between the Nazis and the anti-Nazis in Danzig increased, but the German-Polish ten-year treaty of friendship of Jan. 26, 1934, agreeing that neither country would use force against the other averted open war until 1939. Meanwhile Poland's new port of Gdynia, founded soon after the World War, connected by railway with Warsaw, and favoured with Polish capital and railway rates, grew with such mushroom rapidity that it threatened economic disaster to the old Hanseatic city.

In Sept. 1938 Hitler signed the Munich Agreement, annexed the Sudeten Germans, and declared that he had no more territorial ambitions in Europe. Yet on October 24 he secretly demanded from Poland both Danzig and a strip of territory across the Polish Corridor to connect East Prussia and the Reich. On March 21, 1939, a week after he had completed the annihilation of Czechoslovakia by annexing Bohemia, Hitler repeated his demand. The Poles refused, fearing that compliance would simply mean the first step in the dismemberment of their republic. On April 28 Hitler denounced the German-Polish treaty of 1934. Nazis in Danzig began to smuggle troops and arms into the city as if in preparation for an armed revolt. To prevent this smuggling of weapons Poland increased her customs inspectors. This customs dispute became one of the factors which determined Hitler to invade Poland on

Sept. 1, 1939, and to announce that henceforth Danzig and the Polish Corridor were reunited with the Reich. Albert Forster, head of the Danzig Nazis, became District Leader (Gauleiter) of the city and the surrounding territory. (See also EUROPEAN WAR.)

See article DANZIG in *Encyclopædia Britannica*; and Ian F. D. Morrow, *The Peace Settlement in the German-Polish Borderlands* (Oxford Univ. Press, 1936). (S. B. F.)

Daranyi, Koloman (1886–1939), Hungarian statesman, was born at Budapest on March 22 and studied at Budapest university before joining the Imperial and Royal 13th Hussars as an officer during the World War. After the war he occupied various local political offices and in 1928 was appointed secretary of State. In Julius Goemboes' cabinet he was minister of agriculture (1934–36). Four days after Goemboes' death on Oct. 6, 1936 Daranyi became premier. His ministry was often caught in the political crossfire between pro- and anti-Nazi influences. He tried to placate the Nazis, notably by approving Hungary's first anti-Semitic law in March 1938, but the opposition successfully secured his resignation May 13, 1938, on the grounds that his Government had not proved its ability to withstand Nazi propaganda. Daranyi died at Budapest November 1.

Dardanelles: see TURKEY.

Dartmouth College. During the 1939 academic year the faculty's new plan for regulating attendance of undergraduates at classes was given its first trial. There is now no allowance of "cuts" and the penalty for excessive absence from classes is discretionary with each instructor. It is recognized that the new regulations, which encourage self-discipline by the student, need longer experience before they can be truly evaluated, but the first year is judged successful.

Constant efforts are made by the faculty to effect improvements in the new survey course required of all freshmen, known as Social Science 1 and 2. The objective is to give the student in his first year a thorough acquaintance with the social sciences and a background of the world in which he lives. It is followed by a second year required of those students who do not plan to major in any of the social sciences. (S. C. HA.)

Daughters of the American Revolution.

The National Society, Daughters of the American Revolution, organized Oct. 11, 1890, makes eligibility for membership dependent upon direct descent from a patriot who aided in securing American independence. Membership Dec. 1, 1939, approximated 143,000 in 2,500 chapters in every State and in many countries.

Activities of 1939 included: publication in 18 languages and distribution of 304,000 manuals for citizenship, to aid in naturalization; instruction in right use of leisure and respect for rights of others of 117,000 children in Junior American Citizens clubs; gifts of \$86,000 for 16 approved schools for foreign-born, and Southern mountaineers. Improvements for these schools included a laundry, health house, completely furnished and endowed room; also annual gifts from the National Society of \$1,000 each to the two mountain schools on approved list entirely supported by D.A.R. funds. Loans were made to 721 students. Millions of Penny Pines were planted in all States of the Union in commemoration of the national society's 50th anniversary in 1940. Three social workers were maintained on Ellis Island. A high school girl from every State, winner as good citizen, was given a trip to Washington. Some 50,000 copies of *National Defense News*, designed to promote confidence in fundamentals of American democracy, were distributed and 3,000 medals for good citizenship were awarded. The Society publishes the *National Historical Maga-*

zine. A genealogical library and early American museum are open to the public in the Society's headquarters, Memorial Continental Hall, Washington, D.C. (S. C. Ro.)

Davies, John Vipond (1862-1939), American civil engineer, was born in Swansea, South Wales on October 13 and was educated at Wesleyan college in Taunton, England, and at the University of London. In 1889 he moved to New York city, where he was employed as an engineer, and five years later he established his own engineering firm of Jacobs and Davies. During his career as a consulting engineer, he designed and constructed four tunnels connecting New York city and Jersey City and Hoboken for the Hudson and Manhattan railway. He was also construction engineer for 26 aqueduct tunnels in Mexico and was one of the board of three which designed and built the Moffat tunnel near Denver, Colo. Davies died at Flushing, L.I., N.Y. on October 4.

Davis Cup: see TENNIS.

Dawson-Watson, Dawson (1864-1939), American artist, was born in London on July 21 and went to the United States in 1893 to become art director of the Hartford (Conn.) Art Society. Later he taught at Byrdcliffe colony, Woodstock, N.Y. and, for 11 years, at the St. Louis School of Fine Arts. Aside from his paintings in oil and water colours, he designed textiles and costumes and was a wood carver, mezzotint engraver, and scenic artist. He died at San Antonio, Tex. on September 3.

Deafness. The otologist's service for a hard of hearing patient has been greatly enhanced by the advent of the audiometer, an instrument to measure deafness. Formerly, the physician employed voice and whisper tests, tuning forks, reeds or similar devices, but now the multiple tone audiometer, in which frequency and intensity are controlled, enables the physician to diagnose hearing defects much better. Recently audiometers have appeared on the market that meet the requirements for acceptable audiometers adopted by the Council on Physical Therapy of the American Medical Association.

Hearing aids were improved considerably during the year 1939. The thermionic tube hearing aid is a new product and it bids fair to surpass the performance of other types of instruments. It is a miniature radio receiving set equipped with a small crystal microphone differing from the conventional hearing aid of the carbon granule microphone and the telephone circuit. For some conditions of deafness the carbon granule microphone hearing aid will probably not be replaced, at least for the present. The thermionic tube hearing aid is new and has not been tried very long. It may contain defects which are not discernible at the present time but may come to light in the future. The carbon granule microphone hearing aid, on the other hand, has been tried for many years and is perfected probably to the highest degree possible. To the normal ear the amplifying and intelligibility characteristics are superior for the thermionic tube hearing aid. Battery cost to energize the thermionic tube hearing aid at the present time is somewhat higher than that of the carbon granule microphone hearing aid. (H. A. C.)

Deaths (of prominent persons in 1939): see OBITUARIES.

Death Statistics. Since sickness statistics are far from complete, it is common to use death statistics to gauge health conditions in communities. Because communities vary in numbers of population, it is the practice to

compare death statistics in the form of death rates per 1,000 of population. According to official reports, there were 1,380,986 deaths in the United States during 1938; since the population for that year was estimated to have been 130,215,000, the death rate was 10.6 per 1,000 of population. In England and Wales, the death rate in 1938 was 11.6 per 1,000. These death rates compare very favourably with those for most countries of the world.

Among the few countries with death rates lower than those for the United States and England and Wales during the period 1936-38 are: Canada, with a death rate of 9.8 per 1,000; Denmark, 10.7; The Netherlands, 8.7; Norway, 10.3; Australia, 9.5; and New Zealand, 9.2. The following countries, among others, recently experienced death rates of 20 per 1,000, or more: Mexico, 23.0; Chile, 24.6; British India, 22.9; and Egypt, 27.5. In addition to these countries, there are many others with very poor health conditions which do not compile their death statistics. The death rates here cited, and those for several other countries, are shown in the accompanying table.

Death rates vary according to race, sex, age and marital status. Thus, among white persons in the United States during 1937, the latest year for which data by colour are available, the death rate was 10.8 per 1,000, while among coloured persons, it was appreciably higher, namely, 14.7 per 1,000. Considered in relation to sex, the death rate among males is higher than among females in most countries of the Western world. For example, white males in the United States had a death rate of 12.0 per 1,000 in 1937, while the figure for white females was 9.6 per 1,000. The corresponding death rates for England and Wales were 13.2 per 1,000

Average Annual Death Rates per 1,000 Total Population in Certain Countries for the Period 1936 to 1938 and for Each Year in the United States and in England and Wales from 1900 to 1938.

Country	Death rates per 1,000 1936 to 1938	Year	Death Rates per 1,000	
			United States (c)	England and Wales
North America		1900	17.6	18.2
United States	11.1	1901	16.5	16.9
Canada	9.8	1902	15.9	16.3
Mexico	23.0 (a)	1903	16.0	15.5
South America		1904	16.5	16.3
Argentina	11.9			
Chile	24.6	1905	16.0	15.3
Colombia	16.0	1906	15.7	15.5
Uruguay	10.2 (a)	1907	16.0	15.1
Venezuela	18.1	1908	14.8	14.8
Europe		1909	14.4	14.6
Austria	13.5			
Belgium	13.0	1910	15.0	13.5
Bulgaria	13.7	1911	14.2	14.6
Czechoslovakia	13.4	1912	13.9	13.4
Denmark	10.7	1913	14.1	13.8
Eire	14.4	1914	13.6	14.0
England and Wales	12.0			
Estonia	14.9			
Finland	13.3	1915	13.6	15.7
France	15.2	1916	14.0	14.3
Germany	11.7	1917	14.3	14.2
Greece	15.1 (a)	1918	18.1	17.3
Hungary	14.3	1919	12.9	14.0
Ireland, Northern	14.4			
Italy	13.9	1920	13.0	12.4
Latvia	14.0	1921	11.6	12.1
Lithuania	13.0	1922	11.7	12.7
Netherlands	8.7	1923	12.2	11.6
Norway	10.3	1924	11.7	12.2
Poland	14.0			
Portugal	16.0	1925	11.8	12.1
Rumania	19.4	1926	12.3	11.6
Scotland	13.3	1927	11.4	12.3
Spain	15.7 (b)	1928	12.1	11.7
Sweden	11.8	1929	11.9	13.4
Switzerland	11.4			
Yugoslavia	16.2 (a)			
Asia		1930	11.3	11.4
India, British	22.9	1931	11.1	12.3
Japan	17.1 (a)	1932	10.9	12.0
Palestine	16.7	1933	10.7	12.3
Other Countries		1934	11.0	11.8
Australia	9.5			
Egypt	27.5 (a)	1935	10.9	11.7
New Zealand	9.2	1936	11.5	12.1
Union of South Africa (Whites)	10.1 (a)	1937	11.2	12.4
		1938	10.6	11.6

(a) Average for 1935 to 1937.

(b) Average for 1934 and 1935.

(c) For years prior to 1933, the death rates relate to an expanding area within the United States.

males and 11.7 per 1,000 females. There is a striking variation in the death rate with age. According to the experience of the total population of the United States during 1937, the death rate was just over 50 per 1,000 babies in the first year of life, but fell rapidly at successive ages to a minimum of practically one per 1,000 children at age 10. The death rates per 1,000 then rose to 2.73 at age 20, to 3.85 at age 30, to 12.04 at age 50, and to 53.29 at age 70. When marital status is taken into consideration, it is usual to find, in Western countries, that the death rates are lowest among the married and highest for the widowed and divorced, while those for the single fall in between. An exception to this general situation is found at the early child-bearing ages, where the risks of maternity among married women are sufficient to bring their death rates to a level higher than that for the single, widowed or divorced women of the same ages.

There is a distinct gradation in the death rates in passing from the lowest to the highest social-economic classes of a community. In a study based upon the United States census of 1930 and death statistics for 10 States during that year, it was found that the death rates per 1,000 males between the ages of 15 to 64 in the several social-economic classes were as follows: unskilled workers 13.1; semi-skilled workers, 9.9; skilled workers, 8.1; clerks, proprietors, managers, and officials, 7.4; professional men, 7.0; and agricultural workers, 6.2 per 1,000. The low figure for agricultural workers calls attention to the low death rates in rural areas of the United States as compared with the urban communities; in 1930, white persons residing in rural areas had a death rate of 9.8 per 1,000, while those living in urban centres experienced a rate of 11.6 per 1,000.

Death statistics may also be analyzed according to the cause of death. Thus, the death rates from the ten leading causes of death per 100,000 total persons in the United States during 1937 were, in order of rank: heart disease, 268.0; influenza and pneumonia, 114.5; cancer, 112.0; cerebral haemorrhage, 86.5; accidents, 81.5; nephritis, 79.6; tuberculosis, 53.6; diseases of early infancy and congenital malformations, 49.0; diabetes mellitus, 23.7; and arteriosclerosis, 17.1. These ten causes of death accounted for 78.9% of the deaths from all causes.

There has been a steady decrease in the death rate in most Western countries since about the middle of the 19th century; the improvement has been particularly marked since 1900. Thus, in England and Wales, the death rate fell from 18.2 per 1,000 in 1900 to a minimum of 11.4 in 1930; following a slight rise to 12.4 in 1937, it dropped to 11.6 in 1938. In the United States, the death rates per 1,000 fell from 17.6 in 1900 to a record low of 10.6 in 1938. However, current reports indicate that there may be a slight rise in the death rate for 1939. Figures for the years from 1900 to 1938 are shown in the table on p. 201.

Aside from any other factors, the distribution of the population of a community according to age influences its death rate. Two communities may have identical death rates at each age of life, but the number of deaths of persons of all ages, per head of total population, may differ appreciably between the two communities, simply because one of them may happen to have a larger proportion of aged persons than the other. To overcome this difficulty, death rates may either be "standardized" to allow for the effect of variations in age distribution, or comparisons may be based upon the average length of life, which is also known as the expectation of life at birth. This figure is obtained from a computation which is based upon death rates at each age of life without being influenced by the age distribution of the community.

Sweden has the longest series of figures for the average length of life. Whereas males in that country had an average length of life of only 33.20 years in 1755-76, the figure increased steadily to 63.22 years in 1931-35.

Average Length of Life in Certain Countries

Country	Period	Average Length of Life, Years		Country	Period	Average Length of Life, Years	
		Males	Fe-males			Males	Fe-males
North America United States, whites . .	1901 1910 1919-20 1929-31 1937	48.23 50.23 55.33 59.12 60.75	51.08 53.62 57.52 62.67 65.08	Europe (cont.)			
Negro . .	1929-31 1930-32	47.55 58.96	49.51 60.73	Iceland . .	1901-10	48.3	53.1
Canada . .	1930-32	58.96	60.73	Ireland . .	1925-27	55.42	56.11
Europe				Northern . .	1930-32	53.76	56.00
Austria . .	1930-33	54.47	58.53	Italy . . .	1934-36	55.39	60.93
Belgium . .	1928-32	56.02	59.79	Latvia . .	1931-35	65.1	66.4
Bulgaria . .	1925-28	45.92	46.64	Netherlands	1921-31	60.98	63.81
Czechoslo-				Norway . .	1931-32	48.2	51.4
vakia . .	1929-32	51.02	55.18	Poland . .	1926-27	41.03	46.79
Denmark . .	1931-35	62.0	63.8	Russia . .	1930-32	56.0	59.5
Eire . .	1935-37	58.20	59.62	Scotland . .	1755-76	33.20	35.79
England and				Sweden . .	1816-40	39.50	43.56
Wales . .	1841 1901-10 1930-32 1937	40.19 48.53 58.74 60.18	42.18 52.38 62.88 64.40	Switzerland	1901-10	54.55	57.00
Estonia . .	1932-34	53.12	56.60	Asia	1931-35	63.22	65.33
Finland . .	1931-35	53.94	58.69	China (rural)	1929-31	34.85	34.63
France . .	1928-33	54.30	59.02	India . .	1931	26.91	26.56
Germany . .	1932-34	59.86	62.81	British . .	1926-30	44.82	46.54
Greece . .	1928	49.09	50.89	Japan . . .	1931	65.04	67.88
Hungary . .	1930-31	48.27	51.34	Others			
				Australia . .	1932-34	63.48	67.14
				New Zealand	1931	65.04	67.88
				Union of So.			
				Africa,			
				whites . .	1936	60.01	64.00

The average length of life for white persons in the United States is much the same as that for England and Wales. In 1937, white males in the United States had an average length of life of 60.75 years and white females of 65.08 years, while the corresponding figures in England and Wales in 1937 were 60.18 years for males and 64.40 years for females. Figures for the average length of life in other countries are shown in the accompanying table.

BIBLIOGRAPHY.—Louis I. Dublin and Alfred J. Lotka, *Length of Life* (1936); Louis I. Dublin and Alfred J. Lotka, *Twenty-Five Years of Health Progress*, Metropolitan Life Insurance Co. (1937); Walter F. Wilcox, *Introduction To The Vital Statistics of the United States*, Bureau of Census (1933). (A. J. Lo.)

Debts, Government: see NATIONAL DEBTS.

Declaration of Panama: see HISPANIC AMERICA AND THE EUROPEAN WAR; INTERNATIONAL LAW; NEUTRALITY; UNITED STATES.

Defence, National: see DEMOCRATIC PARTY; NATIONAL GUARD; UNITED STATES; see also under various countries.

Delaware, one of the 13 original States, popularly called the "Diamond State." Area, 2,399.2 sq.mi. (land, 1,961.7; water, 437.5) (see *Delaware Notes*, 12th ser., p. 111). Population (1930), 238,380. Capital, Dover, 4,800. The only larger city is Wilmington, 106,597. Public school attendance (Sept. 1939), 42,454.

History.—The 1939 legislative session, continuing intermittently until August, was marked by dissension between a Republican legislature and the holdover Democratic administration. "Ripper" legislation, passed over Democratic Governor McMullen's veto, gave the Republicans control of the New Castle county election machinery, and, after a contest in the courts, of the politically-important State Highway Department. The Democrats could do little in reprisal except hold up some appropriation bills.

The veto in April of a bill enabling Wilmington to legalize Sunday movies inspired agitation for the repeal or enforcement of Delaware's old "blue laws." Surveys by Wilmington police during the summer disclosed technical violations by the hundreds every Sunday—even the investigators were law-breakers in driving their cars on the Sabbath. Charges were brought against two merchants in December. State taxes on admissions and pari-mutuel betting at Delaware Park race track during its first three years of operation (1937-39) yielded \$818,000.

Business and Industry.—At the year's close Babson estimated current Wilmington business as 25% better than in 1938 (national average, 20%). For November New Castle county industrial employment was up 19%, payrolls 28%, above Nov. 1938. In the first nine months of 1939, passenger automobile sales increased 39%, refrigerators 43%, life insurance 27%, electricity output 19%, over a like period in 1938. Building in Wilmington totalled \$5,470,000, the best year since 1929 and almost double 1938's figure. Suburban residential construction flourished. From 1935 to Nov. 1939 3,838 families moved into the Wilmington area, mostly to the suburbs. A new industrial era for southern Delaware (still largely agricultural) began with the opening December 15 of the duPont Company's \$8,500,000 nylon plant near Seaford, to employ about 850 workers. (The Company applies the generic term "nylon" to a group of new synthetic polyamides which can be drawn into fibres, bristles, and other forms of great strength and elasticity.) Nylon "intermediates" are brought from a duPont plant in West Virginia to Seaford for processing into commercial forms, chiefly, at present, yarn for hosiery knitters.

Delaware agriculture registered a modest advance; 1939 cash income was expected to exceed 1938 by 5% to 10%, but to fall short of 1937. For the fiscal year ending June 30 Delaware received \$9,716,000 from the Federal Government for relief, pensions, agriculture, highways, etc. PWA grants of \$1,185,000 made possible a construction program costing nearly \$3,000,000. Largest project was a new building and additions to the library of the university, finished in December. Improvement of the year was trackless trolleys for Wilmington. The changeover from rails to rubber began in August 1939, was planned for completion in Jan. 1940.

BIBLIOGRAPHY.—Books of 1939: *New Castle*, text by Anthony Higgins, photographs by Bayard Wootten; Jessie Harrington, *Silversmiths of Delaware*; William S. Taber, *Delaware Trees* (State Forestry Department); H. C. Bounds, *A Postal History of Delaware* (1938). (H. C. Rd.)

Delaware River Aqueduct: see AQUEDUCTS; TUNNELS.

Dementia Praecox: see NERVOUS SYSTEM; PSYCHIATRY.

Democracy is not only a technique of government, based upon freely elected representative institutions and upon an executive responsible to the people; it is based upon the fundamental assumption of the equality of all individuals and of their equal right to life, liberty (including the liberty of thought and expression), and the pursuit of happiness. The denial of this equality and individual liberty is characteristic of fascism, which has risen during the last years as a conscious and aggressive opponent of democracy. The victories which the resolute and ruthless policies of fascism accomplished, especially in the field of international relations, resulted in a revitalization of democracy in the democratic countries. This new strength expressed itself not only in the internal field. As far as elections were held during 1939 in democratic countries, they increased everywhere the strength of the democratic and liberal parties. The small and often rivalling fascist groups in the democratic countries were reduced to complete insignificance. On the other hand the communist parties and fellow-travellers who until the middle of 1939 had emphasized their willingness for co-operation with the democracies against fascism turned, after the conclusion of the pact of non-aggression between the Soviet Union and National Socialist Germany, against democracy. Their sudden turn-face cost, however, the sympathy of many democratic and liberal circles who had supported the idea of a common popular front of progressive and radical elements. On the whole, fascist and communist attacks upon democracy led to a reappraisal and a reassertion of the fundamental attitudes and truth inherent in the democratic position. This new strength expressed itself also in the field of international relations. Until 1939 the irresoluteness and the lack

of co-operation of the democratic powers had led, through a policy of neutrality and non-intervention, to the triumph of fascist aggression and to the collapse of the League of Nations. The year 1939 saw a fundamental change in the attitude of British and French democracy. The two nations abandoned the policy of isolation which they had pursued for the last years. Their effort to check fascist aggression involved them in the war which broke out in Sept. 1939. Thus they started to establish a close co-operation of the democracies in international affairs which alone can make a democratic world safe for democracy. It was generally realized that the effort for the protection of democracy and for the checking of aggression, which was undertaken by Great Britain and France in the European war, would have lasting results only if it would lead to some organized and permanent form of international co-operation. The well advanced and growing co-operation between Great Britain and France promised to develop into the nucleus of such a future organization. It may be a rejuvenated League of Nations, this time backed by the will of the peoples to establish collective security and to abandon isolation. At the beginning of Dec. 1939 the League of Nations assembled for the purpose of taking a stand against the aggression of the Soviet Union against Finland. In 1939 an American journalist, Clarence Streit, proposed in his much discussed book, *Union Now*, the establishment of a federated government among the democracies, following the example of the 13 North American States at the end of the 18th century. Generally it may be said that a new will grew up to apply democracy to the international field and thus to make democracy secure internally.

An International Congress of American Democracies opened at Montevideo in March for the purpose of forming an inter-American organization to combat fascism and race hatred in all their ramifications. The Argentine government issued a decree according to which all organizations must be organized on a democratic basis and are forbidden to wear uniforms or insignia. (See also COMMUNISM; FASCISM; FRANCE; GREAT BRITAIN; PACIFISM.)

BIBLIOGRAPHY.—Hans Kohn, *Revolutions and Dictatorships* (1939); Charles E. Merriam, *Prologue to Politics* (1939); Eduard Benes, *Democracy Today and Tomorrow* (1939); Alfred Zimmern, *Spiritual Values And World Affairs* (1939). (H. Ko.)

Democratic Party. As 1939 opened, the Democratic party continued in control of the executive and legislative branches of the National Government. The elections of the preceding November, however, had reduced its huge majorities in House and Senate. When the 76th Congress convened on January 3, the Democrats held 69 Senate and 262 House seats, as compared with 75 and 333 respectively in the 75th Congress. Postmaster General James A. Farley remained as chairman of the Democratic National Committee. In the House, William B. Bankhead of Alabama held office as Speaker, with Representative Sam Rayburn of Texas as floor leader. Senator Alben W. Barkley of Kentucky continued as Democratic Senate leader.

Reflecting the conservative trend of the 1938 elections, many Democrats in Congress evidenced a more critical attitude toward the New Deal. It soon became apparent that the President, despite the Democratic majorities in Congress, would have trouble in securing the enactment of his legislative proposals. On many issues the Democrats were sharply divided.

Though Administration leaders in Congress succeeded in blocking amendments to the Wage-Hour and Labor Relations Acts, they failed to defeat a House Resolution, offered by Representative Howard W. Smith, Democrat of Virginia, to investigate the National Labor Relations Board, and they were unable to prevent the enactment of the Hatch bill to prohibit "pernicious political activities" by Federal office-holders. Many Democrats joined with the Republican minority in voting for the NLRB investigation and the Hatch bill.

In a letter to Senator James F. Byrnes of South Carolina, on June 21, 1939, President Roosevelt proposed a \$3,000,000,000 "spend-lend" program, to include self-liquidating loans by Federal agencies over periods ranging from two to seven years. As part of his new "pump-priming" plan, the President also asked Congress to increase by \$800,000,000 the borrowing-lending power of the United States Housing Authority.

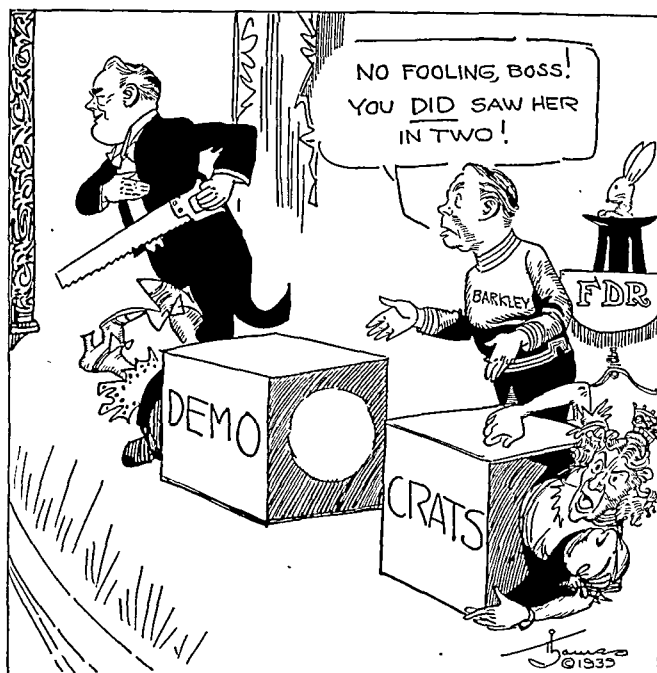
As finally passed by the Senate on July 31, by a vote of 52 to 28, the spend-lend bill had been whittled down to an authorization of \$1,615,000,000. On August 1, a coalition of House Republicans and independent Democrats caused the rejection of a resolution calling for immediate consideration of the bill. The vote was 193 to 167. This action killed the spend-lend measure for the session. Though the Senate approved a bill to increase the lending power of the USHA, the House on August 3, refused to take it up before adjournment, another major reverse for the Administration. On January 17, in letters to the Chairmen of Senate and House committees, the President asked legislation to construct the Florida Ship Canal and complete the Passamaquoddy tidal power project, work on which had been halted by Congress in 1936. The Administration met defeat again when the Senate, on May 17, rejected a Florida Ship Canal bill by a vote of 45 to 36. Neither House considered the Passamaquoddy bill.

Though Congress voted \$2,539,805,000 for relief, only \$50,000,000 less than the amount requested by the President, it eliminated the theatre and art projects, and wrote into the bill drastic restrictions. Following charges that WPA funds had been used for political purposes, the House Appropriations Committee made an investigation of the administration of Federal relief.

In the acceptance by Congress of the large National defence program submitted by the President, the Administration won its most important single victory of the session. Congress, however, rejected a proposal to spend \$5,000,000 in developing the harbour at the island of Guam in the western Pacific. Early in the session, Congress approved a modified Government reorganization measure. In 1938, in a major set-back for the Administration, Congress had rejected a more comprehensive Government reorganization bill. Many Democrats joined with the Republicans in opposing the extension of the President's monetary powers. After a series of defeats for the President, Congress adjourned on August 5. Following the outbreak of the European war, the President on September 13, called Congress to meet in extra session to revise the Neutrality Act. After an extended debate, it repealed the arms embargo and approved a "cash-and-carry" Neutrality Act. Many Democrats who had opposed other Administration measures, supported its neutrality proposals. On October 1, Alfred E. Smith, Democratic candidate for president in 1928, who had opposed the New Deal in 1936, called on the Nation to stand behind the President in his fight to repeal the arms ban. As the special session ended on November 3, the President had done much to regain control over his party in Congress.

Though the President remained silent as to his 1940 intentions, the third term question was much discussed during the year by Democratic leaders. Secretaries Ickes, Wallace, Attorney General Murphy, and several high Administration officials, and many party leaders urged the President's renomination. On August 17, Senator Frederick Van Nuys, Democrat of Indiana, declared that 15 Democratic Senators would oppose a third term for the President.

On August 23, Speaker Bankhead declared his willingness to run for the presidential nomination, if backed by his own State. On December 16, Vice President Garner, from his home in Texas, formally announced his candidacy for the Democratic presidential nomination. Paul V. McNutt, Federal Security Administrator, was also an active candidate for the nomination. He let it be known, however, that he would support the President, if the latter sought

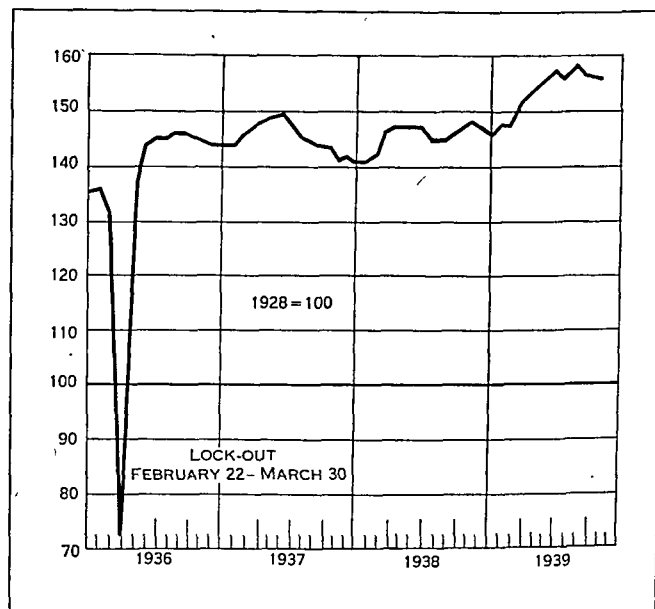


"SOMETHING WRONG WITH THE MAGIC." A reference by Thomas in *The Detroit News* to Roosevelt's Jackson Day speech Jan. 7, 1939, in which he invited dissatisfied Democrats to leave the party

renomination. On December 30, Chairman Farley issued a call for the Democratic National Committee to meet in Washington on Feb. 5, 1940 to select a city, fix the time, and make other preliminary arrangements for the National convention. On the same day, it was revealed that several Republican leaders in Congress, with the approval of the President, had been invited to attend the Democratic Jackson Day Dinner in Washington on Jan. 8, 1940. Among those invited were Senators Charles L. McNary of Oregon and Warren R. Austin of Vermont, Republican leader and assistant leader in the Senate, and Representative Joseph W. Martin, Jr. of Massachusetts, House Republican Chief.

(O. McK.)

Denmark. Area 16,575 sq.mi.; population (est. June 1937) 3,749,000. Chief towns (pop. 1935 census): Copen-



DENMARK: Industrial production. Monthly index, partly adjusted for seasonal variation (*The Annalist*)

hagen (843,168), Aarhus (90,898), Odense (78,403), Aalborg (48,132). Ruler, King Christian X; language, Danish; religion, Christian (Lutheran).

History.—Denmark endeavoured throughout 1939 to maintain and consolidate her policy of strict neutrality and all deliberations with the other northern countries and the Oslo powers were to this effect. The Socialist and Radical Stauning-Munch government celebrated its ten years of power after a new election victory on April 3 which gave the two parties together 52.4% of total votes as compared with 55.3% in 1935. Proposal for a constitution involving abolition of the Landsting and lowering of the franchise age from 25 to 23 was rejected by a referendum on May 23 which gave slightly less than the necessary 45% of the electorate. The government expressed readiness to conclude a non-aggression pact with Germany and the pact was signed on May 31 in Berlin. It was agreed upon in a protocol that Denmark was entitled to maintain normal trade relations with a country at war with Germany and this was on the other side recognized in principle by the Allies after the outbreak of war. Crown Prince Frederick and Crown Princess Ingrid toured the United States before opening the Danish and Icelandic pavilion at the New York World's Fair. They passed through London on their outward journey on March 13, and on their way home on May 16.

In August Germany and Great Britain had declared that they would respect Denmark's neutrality. In the first six months of the year production and trade increased, but the war hit Denmark's economy hard. The index of prices for imported goods went up from 113 in August to 156 in November while the corresponding index for exported goods only increased from 110 to 125. In December a delegation headed by Prince Axel visited London to

initiate trade negotiations with the British government.

(E. B.-P.N.)

Education 1938.—Primary schools 4,104; scholars 407,877; secondary schools 368; scholars 72,028.

Defence 1939.—Army—compulsory service—national militia 14,000; navy—2 coast defence; 8 submarines; aeroplanes 65.

Banking and Finance.—Revenue, ordinary (1938-39) 531,796,000 kroner; (est. 1939-40) 535,400,000 kroner; expenditure, ordinary (1938-39) 525,403,000 kroner; (est. 1939-40) 531,200,000 kroner; public debt (March 31, 1938) 1,255,067,000 kroner; notes in circulation (July 31, 1939) 424,519,000 kroner; gold reserve (July 31, 1939) 117,450,000 kroner; exchange rate (average 1938-39) 22.40 kroner=£1 sterling.

Trade and Communication.—External trade (merchandise): imports (1938) 1,623,900,000 kroner; (Jan.-Aug. 1939) 1,128,900,000 kroner; exports (1938) 1,533,900,000 kroner; (Jan.-Aug. 1939) 1,031,600,000 kroner. Communications and transport: roads, suitable for motor traffic (April 1, 1938) 4,871 mi.; railways, open to traffic (1938): state 1,491 mi.; private 1,553 mi.; airways (1938): passengers 42,843, freight carried 314 metric tons; mail 231 metric tons; shipping tonnage (Jan. 1, 1939) 1,232,667 gross tons; tonnage launched (Jan.-June 1939) 61,800 gross tons; motor vehicles licensed (Dec. 31, 1938): cars and commercial 150,778; cycles 29,324; wireless receiving set licences (1938-39) 713,215; telephone subscribers (Dec. 31, 1938) 366,559.

Agriculture and Industry.—Production 1938 (in metric tons): number of pigs slaughtered 3,915,000; barley 1,383,700; rye 1,163,600; wheat 469,800; oats 287,600; potatoes 1,455,600; butter 189,400; beet sugar 182,600; margarine 81,252. Industry and labour: industrial production (1929=100) (average 1938) 135.0; (Aug. 1939) 148.0; aggregate number of hours worked (1931=100) (av. 1938) 132.0; (Aug. 31, 1939) 148.4; number of applicants for work (average 1938) 112,241 (21.4%); (Aug. 31, 1939) 72,328 (12.6%).

(W. H. WN.)

Dental Association, American: see DENTISTRY.

Dentistry. Activity was notable particularly in the work of the National Health Program Committee of the American Dental Association; in the acceleration of the Dental Health Education programs throughout the country; in the vigorous discussions of new plans of dental education; and in the accomplishments in dental research. The American Dental Association has adopted certain principles for the participation of organized dentistry in any national health program. They are:—

- (1) In all conferences that may lead to the formation of a plan relative to a national health program, there must be participation by authorized representatives of the American Dental Association.
- (2) The plan should give careful consideration to: first, the needs of the people; second, the obligation to the taxpayer; third, the service to be rendered, and fourth, the interests of the profession.
- (3) The plan should be flexible so as to be adaptable to local conditions.
- (4) There must be complete exclusion of non-professional, profit seeking agencies.
- (5) The dental phase of a national health program should be approached on a basis of prevention of dental disease.
- (6) The plan should provide for an extensive program of dental health education for the control of dental disease.
- (7) The plan should include provisions for rendering the highest quality of dental service to those of the population whose economic status, in the opinion of their local authorities, will not permit them to provide such service for themselves, to the extent of providing prenatal care, the detection and correction of dental defects in children, and such other service as is necessary to health and the rehabilitation of both children and adults.
- (8) For the protection of the public, the plan shall provide that the dental profession shall assume responsibility for determining the quality and method of any service to be rendered.

THE DANISH CROWN PRINCE FREDERICK and Crown Princess Ingrid at a reception in Denver during their tour of the United States in 1939



In an effort to be constructive, the committee offered the following proposals by which a national health act can be made beneficial to the people of the nation:—

- (1) All Federal health activities, with the exception of military services, should first be combined in one agency.
- (2) A national health bill should consider and make use of the principles established by the House of Delegates of the American Dental Association.
- (3) A separate title should be devoted to dentistry in any national health legislation in order to: (a) make provision for the essential differences between dentistry and other health services, and (b) augment with a comprehensive research program the efforts of the organized dental profession to determine the cause of dental diseases.
- (4) The following dental program should be carried on until the discovery of the cause of dental diseases enables a more informed attack on the problem:
 - (a) A program of preventive dentistry for children that would be based on the present knowledge of the subject, in order to decrease the future accumulation of dental disease. This would include a development of the educational program, initiated by the American Dental Association, to preserve the natural teeth and to teach both children and parents the importance of preventive dentistry during the prenatal, infant, pre-school, and school periods.
 - (b) A program of education for dentists to make available to them the latest advances in preventive dentistry as they are revealed through clinical experience and research.

Dental Health Education Programs.—The American Dental Association for the past 20 years has conducted a program of education for the laity. Most of the Association's efforts are directed at the prevention of dental decay. The Association's educational activities embrace five fields: (a) elementary and high schools, (b) radio, (c) newspapers and magazines, (d) the lecture platform, and (e) the private dental office. In addition to the dental health education activities of the American Dental Association, numerous State dental associations, State departments of health, and private agencies have been conducting enlarged programs in this field. In Massachusetts it has been done by pictures with brief but telling titles. A program of dental service to children has been begun in 40 States. Twenty-nine States employ dentists on the staff of the State health department, and 22 States pay local dentists for service in the maternal and child health programs. With a few exceptions, the programs have been limited to educational and prophylactic activities. In 13 States, corrective work has been undertaken in limited areas.

New Plans of Dental Education.—The tremendous prevalence of dental disease has been repeatedly pointed out. Surveys by varied and numerous agencies have all indicated this. The statement that 98% of all U.S. children have dental caries and 75% of all U.S. adults have pyorrhea has become almost trite. Millberry suggests as a new plan in dental education the training of skilled technicians who will be a responsibility of the fully trained licensed dentist. One new development in dental education, that of training dental men in public health, has received general approval. At least two universities are offering such courses, and the outlook is very bright.

Accomplishments in Dental Research.—The Research Commission of the American Dental Association has just published a book on "Dental Caries—Findings and Conclusions on its Causes and Control." It contains summaries of the work of 195 investigators in 25 countries, with 75 educational, scientific, or health service institutions represented. There is rather general agreement that the cause of dental caries is not really known and that there is no specific cause.

Vitamin Research.—Vitamin B and B₁ attracted especial attention during 1939. The treatment of certain types of neuralgia by large doses of vitamin B₁ has met with sufficient success to warrant the hope that along this road may be found the means of putting to rout that devastating pain in the trigeminal nerve, called tic douloureux. Experiments in rats, carried on by Lee and Sure, in which there was a vitamin B₁ deficiency, discovered a most regular and marked degeneration of myelin in the trigeminal and sciatic nerves. Williams and Spies contend that "the most

constant and striking symptoms of a vitamin B deficiency arise from degeneration in the nervous system." Riboflavin (vitamin B₂ or G) also must not be disregarded by the dentist. Sebel and Butler have pointed out that lesions in the corners of the lips that frequently are difficult to heal may be due to a riboflavin deficiency.

Sinclair has made this interesting observation: "In administering large doses of vitamin B complex, which contains B₁, I have noted regularly the disappearance of the extreme hypersensitivity to the dentin to instrumentation and thermal changes, and also of soft parts to instrumentation and to the hypodermic needle."

Sinclair's further statements should attract the attention of the dentist: "There is no special clinical test available for determining a vitamin B complex deficiency. In the dietary history and symptomatology, the lesions of the mouth and oral mucosa are outstanding." This suggests the need of active investigations in this area. (See also VITAMINS.)

Hormones.—Nathanson and Weisberger reported on "The Treatment of Leukoplakia Buccalis and Related Lesions with Estrogenic Hormone." The oestrogens were administered to patients in two forms—oestradiol benzoate which was used parenterally, and alpha oestradiol which was given by mouth. Their conclusions are of interest:

Evidence is presented which suggests that leukoplakia buccalis and similar lesions are associated with alterations in the menstrual cycle in women and with a deficiency or disturbed metabolism of the sex hormones in both sexes. Treatment with oestrogen based on this evidence has resulted in the complete disappearance of the lesions in 42%, marked improvement in 39% and no improvement in the remaining 19% of 38 patients. In general, the women responded more satisfactorily to the treatment than did the men. Although further observation is needed, it is suggested that this type of therapy in combination with other well-recognized procedures may prove of value in the treatment of leukoplakia buccalis.

In view of the fact that leukoplakia buccalis is regarded as a precancerous lesion, the implications of this report are far-reaching.

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Depth Bombs: see SUBMARINE WARFARE.

Dermatology. Most important in dermatology is the announcement of Saenz, Grau Triana, and Alphonso, on Aug. 3, 1938, that they have found the causative organism of pinta, thus disproving definitely, the theory of a fungous origin. The organism was a spirochaete, morphologically identical with that of syphilis. The discovery was made in Havana and was later confirmed by observations in Mexico. In the treatment of skin diseases, the use of sulphanilamide is significant. Nelson, Rinzler, and Kelsey compared results of treatment by this drug of 344 cases of erysipelas, with a series of 4,473 cases treated from 1930-36, by other methods. In the series treated by sulphanilamide, the mortality was 2.62% in the control group. Apparent cures have been obtained in several cases of actinomycosis, in England and America. Astonishing results have been noted in obstinate cases of chancroid. Kornblith, Jacoby, and Wishengrad treated 65 cases of chancroid without failures or recurrences. In every case, complete healing took place at the end of two weeks. Sulphanilamide has shown encouraging results in lymphogranuloma venereum with rectal involvement. Results of treatment of

lupus erythematosus of the fixed type, by sulphanilamide, have not been uniform. However, a spectacular cure was reported by Anderson of the acute disseminated type, the patient being moribund at the time of the treatment. Favourable results were also recorded by Weiner, Wollenberg and Ingels in cases of the disseminated type. The cutaneous ill-effects of sulphanilamide therapy which have been observed include purpura, scarlatiniform and morbilliform eruptions, erythema, urticaria and exfoliative dermatitis.

Good results have been obtained by Jacobson in coccidioid granuloma, by vaccine therapy. In 20-odd cases of systemic and cutaneous types, results compared favourably with all other methods, including injections of colloidal copper.

Dermatitis has become an important problem in industrial medicine. It is generally admitted that such cases are responsible for 40-60% of all claims for compensation in the United States. The activity of dermatologists in this branch of medicine is shown by excellent symposiums at the recent meetings of the American Dermatological Association and the American Medical Association. An excellent text-book on *Occupational Diseases of the Skin*, by Schwartz and Tulipan, has just appeared. It is the first book in English, on this subject, to have been published since that of Prosser White. According to Foerster and Schwartz, tar and pitch constitute important occupational hazards and often produce dermatitis and melanosis. These are due to photosensitization by ingredients of coal tar having different fluorescent spectrums from those which cause cancer.

Recent knowledge of vitamin deficiency in diseases of the skin has been reviewed by Goodman. In general, the results of treatment are unsatisfactory. A number of articles, however, report favourable therapeutic action of nicotinic acid in pellagra. A striking effect is shown in stomatitis and glossitis, mucous membranes becoming normal as a rule, after 24 hours, or at most, three or four days. The intestinal and psychic symptoms later disappear and the skin finally becomes normal. The use of vitamin B₁ in two cases of acrodynia was reported by Durand, Spickard and Burgess to have been followed by dramatic improvement within three days after the beginning of intramuscular injections. A few favourable reports on acne have been published. The reports on psoriasis show conflicting opinions. (See also VITAMINS.)

Attention has been called by Vieira and by Lindenberg to the comparative frequency, in certain parts of Brazil, of a disease whose clinical features are those of pemphigus foliaceus. Facts are mentioned which favour an infectious causation. From extensive animal experiments, Lindenberg claims that this form of pemphigus, and also psoriasis, and probably lupus erythematosus and alopecia areata are due to filtrable viruses, circulating in the blood. From his work, he claims to have established a new conception of disease, that of a chronic viraemia.

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Destroyers: see NAVIES OF THE WORLD.

Deterding, Sir Henri Wilhelm August

(1866-1939), Dutch oil executive and director-general from 1902 to 1936 of the Royal Dutch Oil company, was born in Amsterdam on April 19. He left school at the age of 16 to join the staff of the Twentsche bank in Amsterdam, but after six years of drudgery as a clerk he decided to seek his fortune in the East Indies. In 1888 he was a bookkeeper at Belawan, in North Sumatra, for the Nederlandsche Handels Mij; the next year he was an agent for the trading company at Medan, and the year following at Penang. In May 1896 he joined the Royal Dutch Oil company, then a comparatively small organization which had been founded six years before. Deterding advanced rapidly and expanded the company until it had storage outlets in many important Asiatic ports. A year after he became director-general he formed the Asiatic Petroleum company, which immediately challenged Standard Oil company for control of the rich oil markets in the Far East. Deterding then extended his operations to Rumania, Russia, Egypt, South America and, in 1908, to the United States. The company he originally founded in Oklahoma became the Roxana company and later the Shell Union company. He retired in 1936 from active direction of his far-flung oil empire. Two years before he had published his autobiography, *An International Oilman*, a work which served to dispel the public notion of him as a legendary giant of international finance. Deterding, who was a Knight of the British Empire, died February 4 at St. Moritz, Switzerland.

Detroit, in Wayne county, in South-eastern Michigan, and on the Detroit river, the metropolis of the State, and the fourth city in the United States; area, 139.6 sq.mi.; population (U.S. census, 1930) 1,568,662; (estimate, 1939) 1,600,000. Foreign-born, 399,281. Canadian and British predominate, greatly exceeding in numbers the Polish group, which is second in importance. Assessed value, \$2,471,597,680; gross bonded debt, \$371,913,460 which includes \$99,718,739 of self supporting utility debt; gross city appropriation, \$133,909,438 including utilities; tax levy, \$67,637,742; tax rate for city purposes, \$27.37.

The economic, and to some extent, the governmental life of Detroit is largely determined by the production of automobiles. The first of the large cities to go into the depression in 1929, Detroit experienced an unusual economic recovery in 1937, due to the renewed buying of automobiles. This recovery was marked by a decided regression in the latter part of the year which was continued throughout 1938 and 1939. Full benefit of the national upturn in 1939 was negated by numerous strikes, the largest of which affected an estimated 80,000 wage earners employed by the Chrysler Corporation and its suppliers, and lasted for 54 calendar days. Settlement was finally effected through intervention of national C.I.O. officials. In this strike the new technique of the "slow down" was introduced, compelling the management to take the initiative in closing its plants and resulting in charges by the union that the cessation was a "lockout." However, unemployment compensation benefits were denied to the groups primarily affected and the distinction between a "strike" and a "slow down," if any, doubtless will be settled by the courts. During 1939 the industry produced about 3,725,000 cars as compared with 2,656,000 in 1938.

At the close of 1939 there were 19,000 families on relief and 30,000 WPA relief workers in Wayne county, Detroit representing more than four-fifths of the total.

One immediate result of the erratic economic situation in the city has been marked fluctuations in total population. There are indications that the total is now only slightly more than at the beginning of the decade. Assessed valuations are still at about the 1924 level, a reduction of one-third.

The heavy relief burden, decreased property values, a continuing current deficit of about \$15,000,000, and large tax budget necessary because of fixed charges complicate the problem of city government.

Much needed maintenance of capital improvements continues to be deferred and highly desirable improvements and services cannot be supplied. The financial difficulties of the city are further aggravated by gradually increasing debt charges which result from the refunding of the municipal debt. Detroit was the largest American city to default, the debt being refunded at a heavy cost in deferred interest.

The recognition of the United Automobile Workers by the automotive companies (except the Ford Motor Company) was followed by discord within the higher management of the union, trials of officers, purges, and finally an open break as to whether the union would affiliate with C.I.O. or A.F. of L. The C.I.O. faction appears to have definitely won, but for some time employers were uncertain as to which group should be dealt with.

As might be expected, the unions have been active in politics and in 1937 presented labour candidates for the offices of mayor and council. All new labour representatives were decisively defeated. In the election of Nov. 1939, the unions were content to support candidates who were not allegedly anti-labour, but charges of C.I.O. domination were used extensively in the campaign against the labour endorsed candidate. The candidate so endorsed was elected by a substantial majority, but there were no significant changes in the council. This victory has been given much publicity as a seizing of the administration of the city by radical labour. Such is by no means the case. The newly inducted mayor has repeatedly affirmed his independence of any faction and no labour leaders have been appointed to important positions.

During the year the administration of the city was affected by charges of corruption within the police department, under investigation by a grand jury, the placing of the police under a separate merit system by charter amendment, extension of civil service to all employees except those of the department of health, altercation with the State authorities concerning the distribution of State aid, and the creation of Detroit as a separate county for the purpose of relief administration. City-State relationships continued to present problems of under-representation of the populous Detroit area in the legislature, a situation that was made more tense by the increased reliance of the local governments upon State subsidies for education, highways, and relief, and questions as to the equity of the formulae employed in such distribution.

An interesting development in the centre of motor production has been the rapid introduction of buses by the municipally owned street railway. New lines are being served entirely by light, inexpensive buses, and after rush hours and on holidays these have been substituted for street cars on many of the rail lines. Under certain conditions the buses have proven cheaper to operate than street cars, but the resulting decreased use of electric power has complicated the operation of the municipally owned power plants.

The system is also experimenting with the operation of parking lots outside the business area, serving these with buses in an effort to relieve downtown congestion. (L. D. U.)

Deuterium: see ISOTOPES, SEPARATION OF THE; MATTER, STRUCTURE OF.

Devil's Island: see FRENCH GUIANA.

Dewey, Thomas Edmund (1902–), U.S. attorney and politician. He was born March 24 at Owosso, Mich., graduated from the University of Michigan in 1923, and received his law degree at Columbia in 1925. He was admitted to the bar of New York in 1926 and was engaged in private practice for the next five years, until his appointment in 1931 as chief assistant U.S. attorney for the southern district of New York. In 1934 he returned for a year to private practice, but also became a special assistant to the U.S. attorney general in the tax proceedings against Charles E. Mitchell. From 1935 to 1937 Dewey was a special prosecutor for the Investigation of Organized Crime in New York city, and in Nov. 1937 he was elected district attorney of New York county. Within the short space of a few months his successful prosecution of New York racketeers and political leaders had made him a figure of national prominence. His most famous trial was that of James J. Hines, Tammany "boss" for alleged protection of leaders in the "policy number" lotteries of New York city. A mistrial was declared Sept. 12, 1938, but Dewey brought Hines to trial again in Jan. 1939 and secured a conviction on February 25. In Nov. 1938, Dewey ran on the Republican ticket against Gov. Herbert H. Lehman for governor of New York but was defeated by the slight margin of 2,383,584 to 2,316,078 votes. Despite this defeat he is a prominent candidate for the Republican presidential nomination in 1940. He formally announced his candidacy Dec. 1, 1939, and inaugurated his campaign immediately.

Diabetes. New peaks of diabetic incidence are discernible. In the United States, where mortality statistics are most easily available, the State with the highest figures is Rhode Island where for 1937 and 1938 the death rates per 100,000 were 42 and 41.9 respectively. New York for 1937 stands next with 36.9 and Massachusetts for the same year with 33.7; the latter rate held in New Hampshire for 1938. Only once between 1933 and 1937 did any other State except those mentioned exceed 33.7 and that was Vermont in 1934 in which there was an exceptional value of 37.2. The lowest rates in 1937 were in New Mexico 8.1, Arkansas 9.2, Arizona 10, and Alabama 10.6 per 100,000. A concentrated effort to explain the high rates in Rhode Island, New York and Massachusetts is indicated.

Possibilities to be considered in explaining these very high and very low death rates are differences in sex, longevity, race, occupation, social status, individual income, or variations in statistical methods in evaluating death certificates. For the entire United States, the diabetic mortality in 1937 was the same as in 1936, namely, 23.7 per 100,000. In New York city in 1938, diabetes ranked eighth as a cause of death and for females alone, sixth.

The number of living diabetics undoubtedly is growing in all countries. The per cent of hospital admissions in Helsinki, Finland, according to Ponteva, whose monograph is rich in statistics, rose from 2.1% before the discovery of insulin to 10.8% in the midst of the depression in 1931, and this experience appears to prevail in the hospitals of all countries. The diabetic population is augmented also because the duration of the disease is lengthening and so much so that it is probably safe to say that the average diabetic acquiring the disease in 1940 irrespective of age at onset will live 20 years. In fact it is known that 12% of a group of 611 patients first seen in one clinic between 1898 and 1914 achieved that duration after onset of diabetes.

To the subject of heredity and diabetes, Rathery has made a valuable contribution and presented a sane discussion. Whereas in his hospital statistics only 16.9% of the patients showed heredity, in his private practice he found 49%. The statistics of most clinics show approximately 25% heredity, but Rathery believes the higher percentage disclosed among his private patients to be

nearer the true value. In general he concludes that heredity is greater in Jews and in children, in the milder than in the severer cases, but the evidence shows no definite conclusion as to predominance of maternal or paternal transmission. Rathery cites Rondelet, a physician of Montpellier at the opening of the 16th century, as the first to note the influence of heredity in diabetes.

The well-being of the diabetic taking protamine zinc insulin represents what is best so far in the treatment of diabetics. It can be measured concretely (1) by the disappearance of hepatomegaly already existing or the lack of appearance of an enlarged liver in new patients; (2) by the fall in deaths due to coma from 64% in a large group of patients prior to 1914 to 3.6% during the year 1937; (3) by the change in appearance, disposition, and character of all the patients, particularly the children.

The working capacity of the modern diabetic has been investigated in England, Finland, and in two of the larger clinics of the United States. The studies show that diabetics today not only can, but do, in large degree maintain themselves. Fully two-thirds work like normal individuals and another sixth do nearly full time work.

The first monograph wholly devoted to studies of trauma in carbohydrate metabolism and diabetes, appeared in 1938 by Viggo Thomsen of Aarhus, Denmark; it is printed in English. Thomsen's detailed clinical investigation of hospital patients admitted with trauma, his experimental studies and his review of the literature, afforded him no evidence to support the contention that trauma caused the disease. In Aug. 1938 a new type of insulin was released for general sale under the name of "insulin specially prepared as a solution of zinc insulin crystals." Like "regular" insulin, this crystalline preparation (containing 0.2-0.4 mg. of zinc per 1,000 units) is clear, acid, and has a quick, relatively shortlived action. It seems to act longer than the regular insulin, though the difference is so slight as to be of minor importance clinically. Crystalline insulin may be used in any situation in which regular insulin has been employed. In addition to the three preparations of insulin now generally accepted and used ("regular," crystalline, and protamine zinc), there are several other types which have been proposed. Among these are hexamine insulin, histone insulin, and globin insulin. Further studies will be necessary to determine the place of these newer preparations in treatment. So far implants of insulin preparations subcutaneously have not been successful.

Although the number of cases of tuberculosis in diabetic patients does not show the reduction which might be expected from the falling rate of tuberculosis in the community as a whole, nevertheless, the number of cases of tuberculosis developing in diabetic patients in proportion to the long duration of their diabetes has definitely decreased since the use of insulin. The great susceptibility to tuberculosis shown particularly in those patients in whom control of the diabetes has been least perfect, notably the cases who have had diabetic coma and also in diabetic children, will remain. However, among a series of 396 cases of diabetics with tuberculosis encountered at one hospital, it is conspicuous that since 1936 no cases have been discovered before the 20th year of age of the patient.

The effects of a disturbance of an endocrine gland are not always localized in that one gland, but are also found in others. This is strikingly illustrated in many diabetic pregnancies. During pregnancy the ovaries, thyroid, and pituitary have altered structure or function and the placenta also assumes the role of an endocrine gland. It secretes the hormones ordinarily formed in the ovary, estrin and progesterin, and a pituitary-like hormone, choriogonadotropin (prolan). In diabetes the normal balance of these placental hormones is often altered. This disturbance of hormonal balance appears to be associated with the accidents of

pregnancy, abortion, miscarriage, premature delivery, toxæmia, still-birth, and neonatal death. It has now been demonstrated that it can be corrected by substitutional therapy. In a small series of patients so treated foetal mortality approached the low incidence of normal mothers. (See also GYNAECOLOGY AND OBSTETRICS.)

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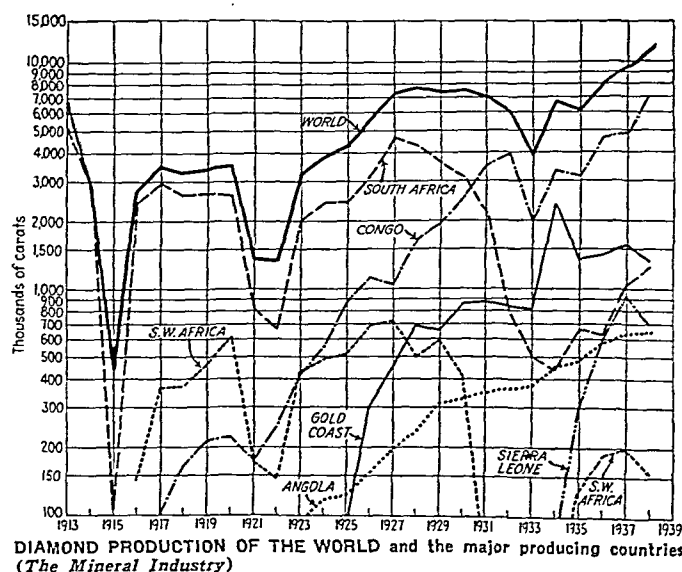
Diamonds. World output of diamonds in 1938 made another new high record of 11,600,000 carats, and an increase of 21% over 1937, almost all of which came from the Belgian Congo, where production was raised by nearly one-half; the only other material increase was in South Africa; Gold Coast and Sierra Leone both declined. In bulk, the Congo output reached 62% of the total, but because of the high percentage of industrial stones, the proportion by value was reduced to probably little more than half this figure. The British Empire produced better than 30% of the total by weight, and nearly 70% by value.

In addition to the producers shown in the production graph, only Brazil and British Guiana had outputs of material size. Producers of minor importance include French Equatorial Africa, French West Africa, Southern Rhodesia, Tanganyika, Borneo, India, and New South Wales.

In 1939, only one mine was in active operation in South Africa, though washing of blue ground stocks was being carried on at two others, with recoveries during the first half of the year 10% above the average rate for 1937, while alluvial recoveries showed an average decline of 27%. Gold Coast during the first half of 1939 was about 20% behind the same period of 1937. No other specific operating data have yet become available.

The Diamond Corporation, the central selling agency that handles the sales for all important producers, reported sales in 1938 valued at about £4,000,000, as compared with £10,000,000 in 1937, a peak value of £12,000,000 in pre-depression years, and a depression minimum of £1,500,000 in 1932.

In 1938, the United States imported 1,818,700 carats of diamonds, valued at \$28,307,000; on a weight basis this is 15.7% of the world output for the year, but on a value basis, the percentage would be much higher. This total included 91,500 carats of rough



stones, 330,900 carats of cut stones, and 1,396,200 carats of industrial stones; although the percentage distribution of these by weight was 5.0 for rough, 18.2 for cut, and 76.8 for industrial stones, the corresponding percentages by value were 25.0%, 60.1%, and 14.9%. The increased demand for diamonds in industry has been phenomenal, expanding more than forty fold since 1929; incidentally, the rapidly rising sales of stones of this class has been an important item in helping producers to weather the depression, which bore heavily on the industry. (G. A. Ro.)

Diatomite. The accumulated siliceous remains of multitudinous numbers of microscopic organisms known as diatoms have found so many industrial uses that the product is now mined in large tonnages, and goes to the market as the mineral formerly called kieselguhr, but now usually known in English-speaking countries as diatomite.

Its chief uses are as a heat insulator, a filter-aid in many types of chemical industry, a filler in paints, varnishes, enamels, and rubber, an abrasive, as an admixture in concrete, and as a carrier for insect poisons. Roughly, production is of the order of 100,000 tons annually in the United States, 80,000 tons in Denmark, 50,000 tons in Germany, 12,000 tons in Algeria, and smaller amounts in a number of other countries. (G. A. Ro.)

Dictatorships: see COMMUNISM; FASCISM; GERMANY; ITALY; SPAIN; UNION OF SOVIET SOCIALIST REPUBLICS.

Diesel Engines: see AVIATION, CIVIL: *Engine Development*; ELECTRIC TRANSPORTATION; MOTOR VEHICLES: *Commercial Vehicles*.

Dies Investigating Committee: see AMERICAN LEGION; CIVIL LIBERTIES; GERMAN-AMERICAN BUND; PROPAGANDA; YOUTH MOVEMENTS.

Dietetics. If not as spectacular as the discovery in 1938 of the deficiency of nicotinic acid in pellagra the recent evidence of human requirements for riboflavin and vitamin B₆ may be as significant. That a pellagra problem still exists is indicated by recent reports. Pellagra symptoms may be cured by nicotinic acid but, if poor diets are continued, other dietary deficiencies become apparent. Neuritis cured by vitamin B₁ may be the first, then riboflavin deficiency characterized by skin lesions particularly about the mouth and nose. A number of patients whose diets remain poor while they receive these synthetic vitamin supplements are still nervous and weak. They are relieved dramatically by synthetic vitamin B₆.

Adaptation of the eye to dark was used extensively in 1939 to determine minimum requirements for vitamin A as well as to indicate its deficiencies in pregnant and nursing women, in patients with cirrhosis of the liver and thyroid disease. Twenty-five per cent of night-blind Africans had Bitot's spots which vitamin A healed. Similar spots were found in the eyes of children in Ceylon along with toad skin. Mellanby's production of deafness in young animals on vitamin A deficient diets through overgrowth of cranial bone may have significant human implications.

Much of the current research on vitamin B₁ is devoted to chemical methods for its determination. Vitamin B₁ treatment continues for a wide range of toxic and neuritic conditions, as peripheral neuritis, herpes zoster, delirium tremens, insomnia and the early cardiopathies of alcohol addicts. It is used successfully in the pre-operative treatment of hyperthyroid patients. Suggestions of metabolic interdependence between manganese and vitamin B₁ and observations of zinc deficiency in beri-beri patients open new fields for speculation and research.

Widespread mild deficiencies of vitamin C are reported, but the optimum human intake is not agreed upon. Saturation levels

are reported by Belser as from 70 to over 100mg. daily. Kellie is "saturated" between 30 and 40mg. per day. For pregnant women the intake should not fall below 75mg. and for lactation 100mg. daily. Increased use of vitamin C has also been noted in diseases which are accompanied by increased oxidation or proliferation as malignant tumour, hyperthyroidism and leukaemia.

Food sources of vitamin K are the green parts of plants and some vegetable oils. Bile must be present for its absorption and the liver adequate to form prothrombin. Interference with any part of this process may so increase blood clotting time as to permit haemorrhage.

Two forms of vitamin K, K₁ from plants and K₂ formed by bacterial action, have been identified. Both forms of the vitamin have been prepared and most details of their structure as derivatives of 1,4-naphthoquinone agreed upon.

From calcium and phosphorus balance studies the requirements of older adults appear to be much the same as those of younger, reduced intakes are not offset by reduced requirements and they are able to restore calcium and phosphorus to the body after depletion. This is significant in view of senile osteoporosis due to long-continued deficiency of calcium and vitamin D. That the rachitic tendency of cereals may be counteracted by adding calcium lactate to the diet is further evidence of favourable supplementary relations between cereals and milk.

Duckworth's summary on magnesium in nutrition calls attention to its roles in metabolism. The importance of magnesium in human nutrition should receive consideration since deficiencies may occur more frequently than has previously been suspected.

Recent evidence of fluorosis comes from England, Denmark, India, North Africa, as well as the United States. In three regions after eight to ten years' change in the water supply the production of mottled tooth enamel has been halted. Of interest also is the unexplained coincidence of lower incidence of carious teeth where drinking water contains fluorine.

Widdowson finds that administering iron in therapeutic doses converts the usual fall of haemoglobin in pregnancy to a rise, which, if the iron be discontinued, falls again at the previous rate. She does not conclude which level is the optimum state. Bethell recognizes haemoglobin below 10mg. per cent as undesirable in the pregnant woman and prescribes iron in addition to at least 50 grams of animal protein and other protective foods to prevent the macrocytic anaemia which he observed.

Almost 200 dietary studies were reported in 1939, practically twice as many as in 1938. A large proportion of these are sponsored or inspired by the Nutrition Committee of the League of Nations. (See also VITAMINS.)

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Diodrast: see X-RAY.

Diphtheria: see EPIDEMICS AND PUBLIC HEALTH CONTROL; PUBLIC HEALTH SERVICES; SERUM THERAPY.

Diplomatic Services: see AMBASSADORS AND ENVOYS.

Disasters. The following list includes outstanding accidents and disasters of 1939. Disasters that resulted from purely military or naval action will be found by date in the CALENDAR OF EVENTS, p. 1 ff. A list of the merchant ships sunk by submarines, mines, and surface craft during the year is included in the article SUBMARINE WARFARE. Warships sunk by naval action during the year are also listed chronologically by date of sinking in the CALENDAR OF EVENTS.

Aviation

- Jan. 7 Near Senlis, France. Zurich-Paris passenger plane crash killed 3, injured 6.
- Jan. 13 Near Miles City, Mont. Crash of airliner killed 4.
- Jan. 14 Near Rio Bonito, Brazil. Passenger plane hit side of mountain; 10 killed.
- Jan. 18 Near Darwin, Australia. Mail-plane crash killed 4.
- Jan. 21 British flying boat "Cavalier" forced down and sank in Atlantic enroute from New York to Bermuda; 2 passengers and steward drowned; 10 survivors were rescued after 10 hours in sea by tanker "Esso Baytown."
- Jan. 23 Near Los Angeles, Calif. Experimental light bomber of U. S. Army crashed, killing test pilot and injuring representative of French Air Ministry, whose presence in plane precipitated inquiry into charges that Gov't had revealed aviation secrets to foreign power.
- Feb. 20 Near Pensacola, Fla. Eight U. S. Navy training planes crashed in heavy fog; two pilots, including Brazilian Navy officer, were killed; six others leaped to safety in parachutes.
- Feb. 24 Near Nice, France. German plane with 12 Nazi army officers aboard crashed in Alps; all were killed.
- Mar. 18 Near Alder, Wash. Experimental submersible transport liner broke apart during test flight; 10 killed, including two members of Dutch aviation mission.
- Mar. 26 Oklahoma City, Okla. Eight killed, 4 injured when airliner crashed and burned.
- April 4 East Braintree, Mass. Four U. S. Navy fliers killed in collision of two planes during launching ceremonies of aircraft carrier.
- May 8 Guayaquil, Ecuador. Crash of military plane in crowded street set fire to surrounding buildings; at least 25 killed, including pilot.
- July 15 Atlantic ocean, 150 miles south-east of New York city. Coast guard plane bringing sick seaman to shore crashed; two pilots and patient killed.
- Aug. 11 Langley Field, Va. U. S. Army bomber crashed and burned; entire crew of 9 killed.
- Aug. 13 Rio de Janeiro, Brazil. Fourteen killed, including Prof. James Harvey Rogers, when "baby clipper" plane plunged into harbour and struck dry dock.
- Sept. 7 Near San Diego, Calif. Navy bomber with crew of 6 struck antenna of radio station; all killed.
- Oct. 19 Near San Diego, Calif. Four U. S. Navy fliers killed in mid-air collision of two dive bombers.
- Dec. 24 Mogador, Morocco. Italian plane inaugurating Rio de Janeiro-Rome air route crashed; 7 killed.

Fires and Explosions

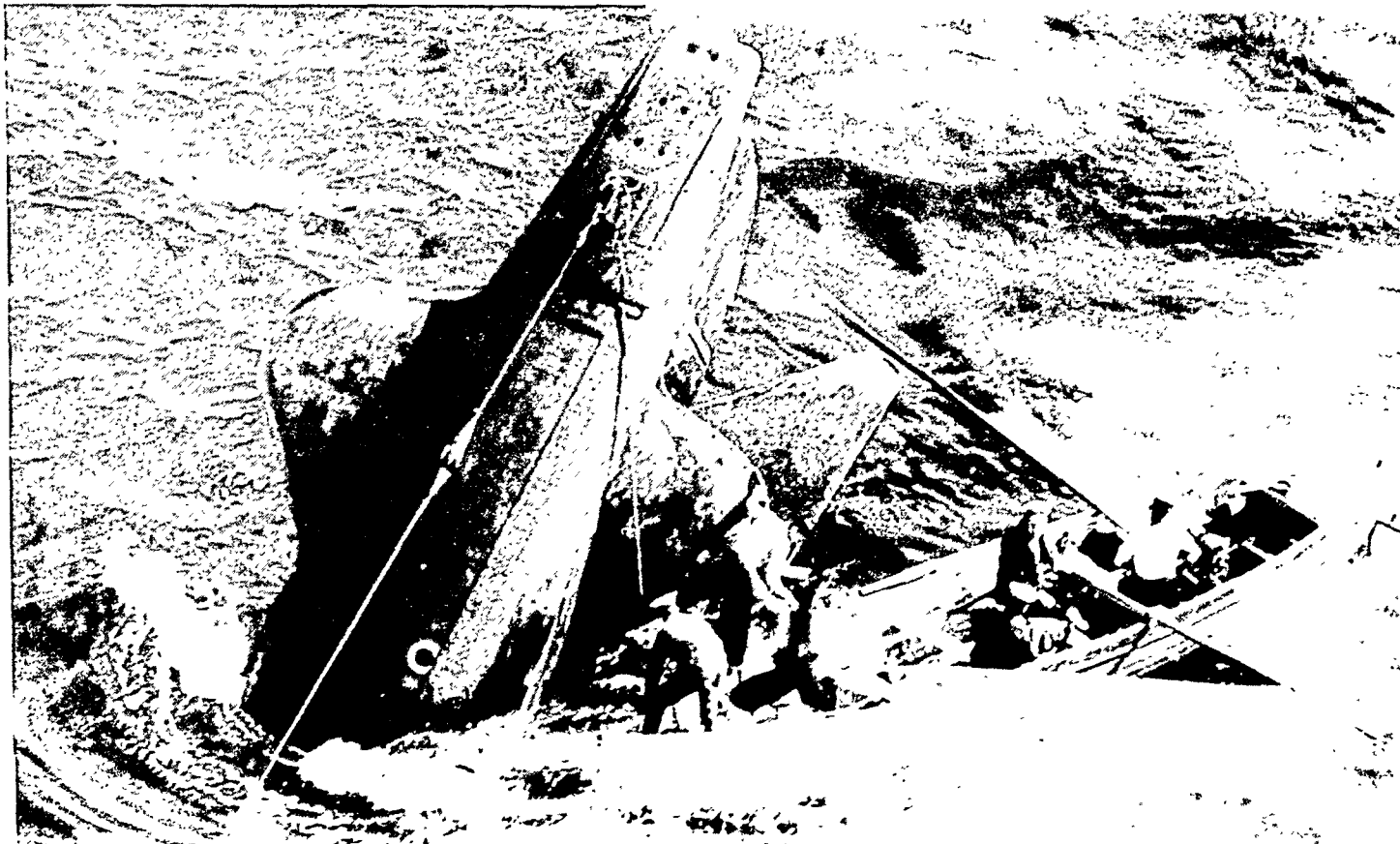
Jan. 9-14 Australia. At least 31 killed in brush fires throughout Victoria.

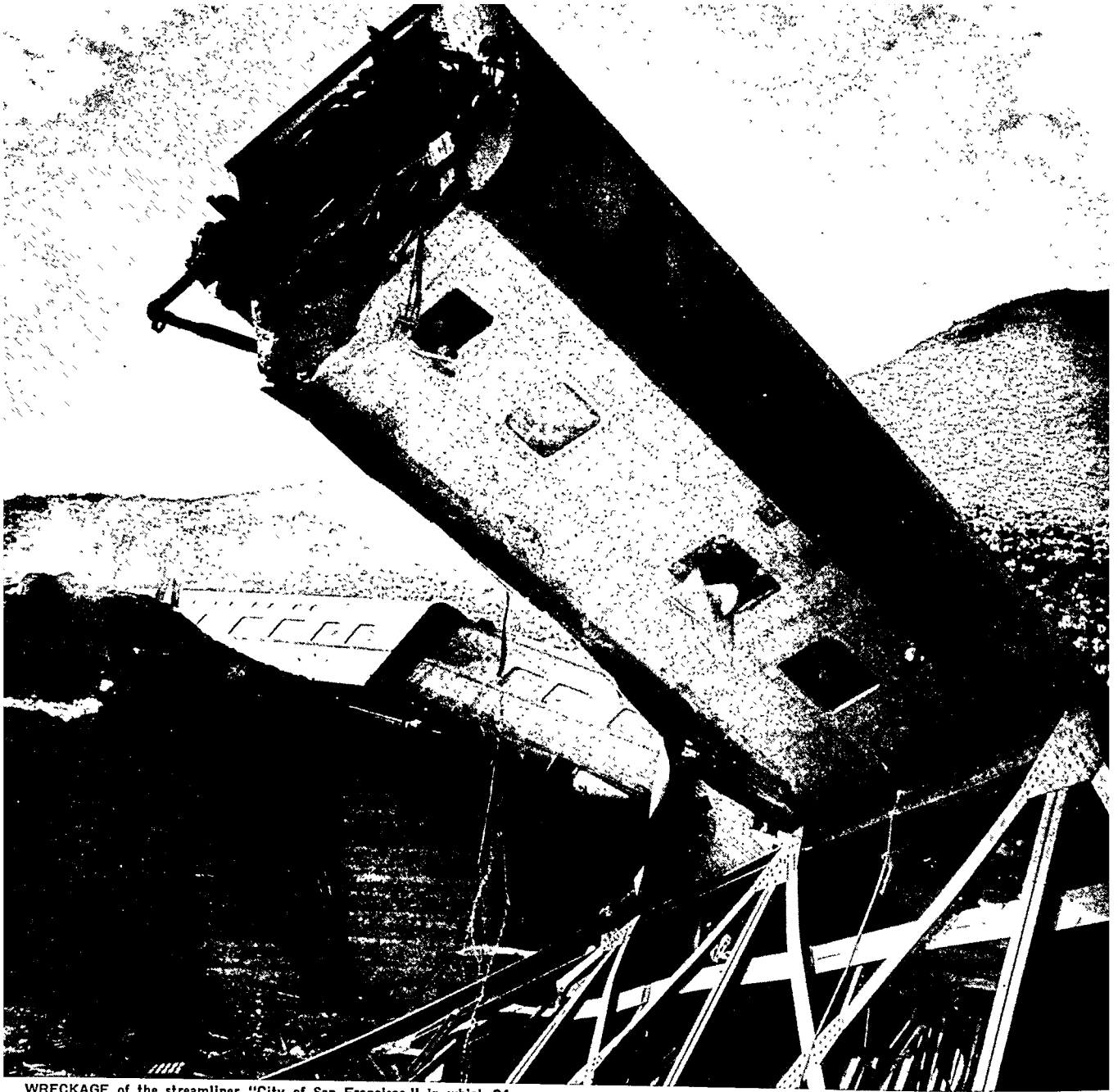
A FLEETING HOPE FOR 99 MEN trapped in the sunken British submarine "Thetis" spurred rescuers June 1, 1939, while the stern projected 18ft. above the surface of Liverpool bay, but a strong tide swept the craft to the bottom

- Jan. 21 Jaunchito, Colombia. Explosion in power storehouse killed 10 outright, injured many others.
- Feb. 3 Syracuse, N. Y. Collapse of wall in burning building killed 8 firemen.
- Feb. 5 Springfield, N. J. Four sleeping children burned to death in home.
- Mar. 1 Hirakata, Japan. Approximately 200 killed, 200 injured in explosion of army arsenal.
- Mar. 2 Halifax, Nova Scotia. More than 30 died in hotel fire.
- Mar. 28 Herstal, Belgium. Explosion in munitions factory killed 8 outright, wounded 40 others.
- April 12 Chicago, Ill. Seven Negroes burned to death in apartment building fire, allegedly set by discharged janitor; two others died later.
- April 19 Le Havre, France. S.S. "Paris" of French line burned and sank; 2 killed.
- April 22 Ottumwa, Ia. Father and five children died in fire.
- May 9 Near Tokyo, Japan. Eight factories destroyed by series of explosions; at least 11 killed, 260 injured; 30 missing.
- May 11 Chicago, Ill. Dust explosion and fire destroyed five grain elevators; 9 dead, 23 injured.
- May 31 Barberton, Ohio. Gas explosion in school house injured 40 children, 4 adults.
- July 10 Peñaranda de Bracamonte, Spain. Approximately 100 killed, 1,500 injured in explosion of munitions factory; town was virtually demolished.
- July 14 Providence, Ky. Twenty-eight coal miners died in explosion.
- July 29 Santa Rosa mountains, Nevada. Four members of Civilian Conservation Corps trapped by forest fire and killed; another missing.
- Aug. 13 Ft. Knox, Ky. Six National Guardsmen killed by explosion of shell they believed to be "dud."
- Sept. 12 (?) Off Casablanca, French Morocco. French warship "Pluton" exploded; at least 100 killed.
- Oct. 27 Dunfermline, Scotland. At least 35 miners killed in colliery explosion.
- Oct. 29 Rock Springs, Wyo. Five schoolboys killed by blast caused by rifle bullet.
- Nov. 13 Lagunillas, Venezuela. Town destroyed by oil fire; approximately 200 dead or missing.
- Dec. 13 Near Brachto, Rumania. Explosion in cellulose factory killed more than 60.

Marine

- Feb. 2 Bungo strait, Japan. Japanese submarine "I-63," with crew of 87 aboard, sank after collision, 6 were rescued.
- Feb. 8 Atlantic ocean, 1,500 miles east of New York. British freighter "Maria de Larrinaga" sank with 37 aboard.
- May 23 Off Hampton Beach, N. H. U.S. submarine "Squalus" sank in Atlantic with 59 men aboard; 33, including Lieut. O. F. Naquin, the commander, were rescued May 24 and 25, and brought to surface in rescue bell; 26 were trapped and drowned.
- June 1 Liverpool bay. British submarine "Thetis" sank with 103 men aboard; 4 escaped through hatch; rescue attempts failed after protruding stern of submarine sank to bottom before it could be cut open or held fast





WRECKAGE of the streamliner "City of San Francisco," in which 24 persons were killed near Elko, Nev., Aug. 12, 1939

- at surface; toll of 99 dead was greatest of any submarine disaster.
- June 15 Cam-Ranh bay, French Indo-China. French submarine "Phenix" disappeared after dive, with 71 aboard. No trace of craft, except oil slick on surface, was found.
- July 18 Pacific ocean, 1,100 miles east of Yokohama. Japanese ship "Bokuyo Maru" exploded and sank; 3 died; 209 rescued.
- July 22 St. Lawrence river, near Deschailions, Que. Schooner cut in half by freighter; 4 missing.
- Aug. 23 Off Ilhéos, Bahia, Brazil. Coastwise steamer "Itacaré" foundered near port; at least 30 drowned.
- Dec. 12 La Perouse (Soya) strait, Japan. Soviet steamer "Indigirka" wrecked in storm; 700 believed killed; approximately 400 rescued.
- Dec. 12 (?) North sea (?) British destroyer "Duchess" sank after collision with another warship; more than 100 believed drowned.
- Dec. 25 (?) Black Sea. Turkish ship "Kilzilmak" sank in storm with entire crew of 20; Greek steamer "Astrea" lost with crew of 14 aboard.

Motor Traffic

- Mar. 29 Near Jackson, Miss. Fourteen died when 11 motor cars plunged into swollen creek through gap in highway caused by washout of bridge. (See also TRAFFIC ACCIDENTS.)

Miscellaneous

- July 22 Mount Baker, Wash. Snowslide engulfed college party of mountain climbers; three men and three girls killed.
- Aug. 5 Near Somerset, Pa. Giant boulder killed four workers in highway tunnel.
- Oct. 23 Perth Amboy, N.J. Five babies killed by escaping steam in hospital.

- Nov. 10 Near Morioka, Japan. More than 200 trapped in sulphur mine; 34 known dead; 60 missing.
- Nov. 17 Near Beaufort, N. C. At least ten drowned in collision between tug-boat and fishing vessel on inland waterway.

Natural Disasters

- Jan. 24 South Central Chile. Earthquake devastated area of approximately 50,000 square miles. Estimated death toll was 30,000, mostly in Concepcion and Chillan. Razed cities were evacuated by survivors.
- Feb. 2-5 Ohio river valley. Five dead in floods; approximately 11,000 homeless.
- Mar. 25 Dawson Creek, B.C., Canada. Eight persons drowned in flood.
- Mar. 25 Near Bareges, France. Avalanches in Pyrenees killed 28; others missing.
- Apr. 15-16 Texas, Louisiana, Arkansas, Oklahoma. Tornadoes killed at least 40.
- June 18 Anoka, Minn. and vicinity. Tornado killed 10, injured 63.
- July 5 North-eastern Kentucky, U.S.A. At least 75 drowned, others missing in "flash" floods from swollen mountain streams.
- August Northern China. Vast areas under flood waters; approximately 10,000,000 persons homeless, starved, or drowned.
- Sept. 22 Vicinity of Smyrna, Turkey. At least 300 killed in earthquake.
- Sept. 24 Southern California coast. At least 18 killed, 57 missing in tropical storm.
- Dec. 27 Northern Turkey. Earthquakes devastated wide regions in Eastern and Northern Anatolia; casualties estimated at more than 100,000 killed or injured; city of Erzingan completely destroyed, with more than 15,000 deaths; floods later increased toll of dead.

Railroads

- Feb. 11 Near Barcelona. Runaway express crashed into local train; 35 killed, more than 100 injured.

- Feb. 19 Near Tennant, Ia. Runaway locomotive collided head-on with passenger train; 2 killed; 23 injured.
- Feb. 24 Near San Luis Potosi, Mex. Train wreck killed 6.
- Feb. 28 Boston, Mass. Trolley car jumped tracks; 6 killed, 25 injured.
- Mar. 30 New York city. More than 200 injured in collision of subway trains.
- April 13 Near Queretaro, Mex. Train wreck killed 28 outright; others died later; more than 50 seriously injured.
- May 25 Near Newington, Conn. Cab of work car sideswiped Montreal-Washington express; 1 killed, more than 20 injured.
- Aug. 12 Near Elko, Nev. Streamliner "City of San Francisco" wrecked after passing over rail that had been bent in and spiked down; 24 killed, 113 injured.
- Sept. 4 Chicago. Six persons standing on track killed by suburban train.
- Sept. 11 Near Warroad, Minn. Three killed, 5 injured in head-on collision of two Canadian National trains.
- Aug. 12 Denver, Colo. Collision of two passenger trains killed one, injured more than 50.
- Oct. 8 Berlin, Germany. Twenty-two killed in collision of trains.
- Nov. 13 Near Oppeln, Germany. Train wreck killed 43, injured 60.
- Dec. 12 Near Hagen, Germany. At least 17 dead in train collision.
- Dec. 22 Near Magdeburg, Germany. At least 132 killed, 109 injured, in collision of two express trains; 99 killed, 40 injured in another wreck near Friedrichshafen.
- Dec. 30 Near Naples, Italy. Frozen switch caused train wreck in which at least 29 were killed, 100 injured.

Disciples of Christ, a religious body having its chief strength in the United States and Canada, which received its initial impulse in 1809, dates its separate existence from 1830, and its nationally organized work from 1849. It is also well represented in Great Britain, Australia and many mission fields. Local churches are generally known as Christian Churches or as Churches of Christ. The headquarters of its United Christian Missionary Society and other promotional and educational agencies are at Indianapolis, Ind. Its National Benevolent Association has headquarters at St. Louis. Its International convention (United States and Canada) is held annually (Richmond, 1939, Roger T. Nooe, president; H. B. McCormick, president for 1940). The quadrennial world convention, set for Toronto, Aug. 6-12, 1940, was postponed on account of the war. Disciples of Christ are participating in the arrangements looking toward the organization of the World Council of Churches. F. H. Groom was visiting American delegate to the convention of British Churches of Christ. Stephen J. Corey, former president of the United Christian Missionary Society, became president of the



THE CITY OF CONCEPCION was almost totally destroyed by the Chilean earthquake of Jan. 24, 1939, which took an estimated total of 30,000 lives

College of the Bible, Lexington, Kentucky. D. S. Robinson succeeded J. W. Putnam as president of Butler university, Indianapolis, Ind. World membership is 1,818,163, a gain of 28,872 for the year. In the United States and Canada there are 1,657,426 members (gain 27,033), 8,071 churches (loss 39), 7,466 ministers (gain 159). For the year ending June 30, 1939, total receipts of national and State agencies reporting to the International convention were \$4,110,241. Receipts for local church maintenance were \$10,875,048. There are many independent missionary agencies not reporting. (W. E. GA.)

District of Columbia: see WASHINGTON, D.C.

Divorce: see MARRIAGE AND DIVORCE.

Dmowski, Roman (1864-1939), Polish statesman and patriot, was born in Warsaw. He studied for the law but soon gave it up to work for the cause of Polish independence. Part of his work was in the open, as leader of the Polish party in the Russian Duma. Most of it was secret. Several times he was jailed by the Russian police, and he travelled extensively in Europe, Asia, and the United States to hold conventions of Polish separatists. He founded the Polish National Democratic party in 1893. During the World War he became president of the Polish National committee in Paris. With Ignace Paderewski he was delegate to the Versailles conference in 1919 and signed the treaty for the new Polish Republic. From 1919 to 1922 he was a member of the Polish diet and in 1923 he was appointed minister of foreign affairs. He retired from active politics in 1924 and died at Warsaw on January 2. See *Encyclopædia Britannica*, vol. 18, p. 148 fol. for the role of Dmowski and others in the struggle for Polish independence.



A RESCUE BELL brought 33 survivors to the surface from the sunken U. S. submarine "Squalus" off Hampton Beach, N. H., May 24 and 25, 1939. Twenty-six men were lost

Dodecanese, The: *see* ITALIAN COLONIAL EMPIRE.

Dog Shows: *see* SHOWS: *Dogs*.

Doherty, Henry Latham (1870–1939), U.S. public utilities and petroleum executive, was born May 15 at Columbus, Ohio, where he was educated in public schools and began his career as a newsboy and as office boy in a public utility company. Between 1890 and 1905 he was an executive of public utilities in St. Paul, Denver, San Antonio, and 26 other cities; then he organized his own company to finance and operate various utilities. In 1910 he organized Cities Service Company, a gigantic holding company which at the time of his death controlled almost 200 petroleum and utility corporations and had assets of more than \$1,000,000,000. Doherty also had extensive real estate holdings in New York city, Florida and elsewhere. Especially in his later years he was actively identified with several philanthropic enterprises. He died December 26 at Philadelphia.

Dolan, Francis James (1893–1939), American educator and clergyman, was born at Boston, Mass. on July 14. He received his education at Boston college, at St. Andrew-on-Hudson, a Jesuit novitiate, and at Woodstock college, Woodstock, Md. He was professor of classics at Loyola college, Baltimore, from 1919 to 1921 and at Holy Cross college, Worcester, Mass., from 1921 to 1923. He was ordained to the priesthood of the Roman Catholic church June 14, 1926. The next year he was appointed dean of freshmen and professor of natural theology at Boston college and, after two years of graduate study in England, he became dean of Holy Cross college in 1931. On July 15, 1933 he was selected as president of Holy Cross and remained in this position until his death September 6, at Worcester, Mass.

Dolci, Angelo Maria (1867–1939), Italian ecclesiastic, was born July 12 at Civitella d'Agliano. He graduated from the Pontifical Academy for Noble Ecclesiastics and was ordained priest in 1890. In 1900 Pope Leo XIII appointed him bishop of Gubbio, and six years later he was named apostolic delegate to Bolivia, Peru and Ecuador. In 1911 he returned to Italy, was named bishop of Amalfi, and sent to Rumania to negotiate a concordat with that country. After the World War he was apostolic delegate to Turkey, during which time he conducted extensive relief work among the Armenians. He then returned again to Rome, where he engaged in administrative work at Vatican city and was created cardinal March 13, 1933. He died in his native town on September 14.

Dominica: *see* WEST INDIES, BRITISH.

Dominican Republic, a West Indian republic occupying the eastern two-thirds of the island of Hispaniola; language, Spanish; capital, Ciudad Trujillo; president, Dr. Jacinto B. Peynado. The area is 19,326 square miles. The population by the 1935 census was 1,479,417, and was unofficially estimated at 1,685,000 in 1939; it is predominantly mulatto and Negro, but whites are politically important. The chief cities are: Ciudad Trujillo (formerly Santo Domingo), the oldest European-founded city in the Western Hemisphere, pop. 71,296, and Santiago de los Caballeros, pop. 33,919.

History.—In January 1939, international attention was attracted by proposals made for the colonization of up to 100,000 Jewish and other refugees from Central Europe in the Dominican Republic, and, in March, a commission appointed by the Intergovernmental Committee on Refugees began a study of the feasibility of such large-scale colonization. Outbreak of war in Europe,

however, prevented any immediate action.

Education.—In 1937, there were 900 public and private primary schools, with an enrolment of 113,530 pupils.

Finances.—The monetary unit is the peso, equivalent to the U.S. dollar. Fiscal control is in the hands of a financial adviser and general receiver of customs nominated by the President of the United States.

Trade and Communication.—The Dominican Republic has good external communication by sea and by air. There are 268km. of government-owned railway and a highway network of over 1,500 kilometres. An additional 982km. of railroad is in use on sugar estates.

In 1938 imports totalled \$11,342,000 in value (principally textiles, machinery and structural materials), a decline of 3% from 1937.

The United States (54%), Japan (11%), Germany (8%), British West Indies (5%), and Great Britain (4%) were the principal sources of imports. Exports declined 9.8% over 1937, and totalled \$14,347,000, going chiefly to Great Britain (42%, against 31% in 1937), the United States (32%), and France (8%, against 14% in 1937), Germany (3%), and the Netherlands West Indies (3%). Exports for the first seven months of 1939 were valued at \$14,745,769, a 28.8% increase over the corresponding period of 1938. The Dominican Republic is primarily agricultural in its production, with sugar the most important crop, and cacao, in which it ranks fourth in the world production, second. These commodities, with coffee, hides, tobacco and lignum vitae, comprise the bulk of the exports. In 1939, cacao and coffee plantations were seriously affected by prolonged drought, and production was estimated to be 20% and 50%, respectively, of normal. (*See also* HAITI; WEST INDIES.) (L. W. BE.)

Donations and Bequests. The number of newly established foundations, endowments and trust funds organized for the benefit of the public continued to grow during 1939. Complete information is nowhere available as to the total chartered, but they run above 300 (Jan. 1, 1940). Upwards of 50 of these appear to be foundations in the sense in which the term was originally used, and thus having substantial endowments. About 33 have principal funds of \$4,000,000 or over.

The latest available study of these institutions reports the total capital of 243 of them as over \$1,200,000,000. Of this amount over 79%, or \$945,000,000 was held by 121 foundations; and the remainder by 122, whose total capital amounted to about \$250,000,000.

Some four additional foundations have reported assets of approximately \$70,000,000, but are not included here because the organizations' complete assets had not yet been made public.

Although at least three of the larger foundations have recently begun to make disbursements from capital, the total capital of foundations has increased during 1939 because of the considerable number of newly established institutions and of new additions to their principal funds. Among the more important additions were: \$5,000,000 to the Murry and Leonie Guggenheim Foundation, designated especially for dentistry and oral hygiene work for children in New York; \$10,000,000 to the Duke Endowment; \$600,000 to the National Foundation for Infantile Paralysis; and a substantial sum given to the Josiah Macy, Jr., Foundation by the original donor, Mrs. Walter G. Ladd.

The Rockefeller Foundation and the Carnegie Corporation continue to hold first and second place in respect to capital, the assets of the former amounting to about 20% of the total capital funds reported by all the foundations, and the assets of the latter to about 17%.

The next four largest, each reporting capital of more than \$46,000,000 and in order of size are: General Education Board, Commonwealth Fund, Kresge Foundation, and W. W. Kellogg Foundation. These six account for over 58% of the total foundation capital recorded in the latest available report.

Announcements of new foundations include the J. W. Van Dyke Scholarship Foundation, with \$1,500,000 to aid in the education of deserving students; the Dazien Foundation for Medical Research, with a bequest of \$1,325,000 for the support of postgraduate research in medicine; and a number of smaller organizations with capital funds and purposes not yet publicly stated.

The President of the Carnegie Corporation has learned of gifts to public libraries of more than \$4,000,000 during 1939, to art museums of more than \$1,000,000; and one bequest for hospital purposes in Texas of \$4,000,000. Large gifts to universities include some \$8,000,000 to the University of Chicago; more than \$8,000,000 to Northwestern university; \$4,500,000 to Yale; over \$4,000,000 to Harvard; approximately \$1,500,000 to the University of California; and \$8,000,000 from the H. W. Putnam Estate now subject to life interests, eventually to be divided among Harvard, Princeton, and Yale.

Among other universities receiving gifts of \$1,000,000 or more were: Emory university, Johns Hopkins Medical school and hospital, and the University of Texas.

A few increments to the number of community trusts, these being endowments held and managed by trust companies with disbursements of income directed by a committee partly made up of public officials, were noted in 1939. A recent report states that over 75 community trusts were in existence in 1938, the last year in which figures are available, with a total endowment of over \$48,000,000 and funds distributed running above \$1,707,000. One of the largest of these is the New York Community Trust, which reported the valuation of its capital funds in early 1939 at upwards of \$8,630,000.

Disbursements since 1933 had averaged something over \$200,000 per year. (See also CARNEGIE TRUSTS; COMMONWEALTH FUND, THE; FALK FOUNDATION, THE MAURICE AND LAURA; ROCKEFELLER FOUNDATION; ROSENWALD FUND, THE JULIUS; RUSSELL SAGE FOUNDATION.)

BIBLIOGRAPHY.—Two publications issued recently giving information on foundations, in addition to annual reports by practically all of them, are: Russell Sage Foundation Library, *American Foundations for Social Welfare* (revised ed.), a directory; Raymond Rich Associates, *American Foundations and Their Fields*, IV. (S. M. HA.)

Donnelly, Charles (1869–1939), American railroad executive, was born at Wisconsin Rapids, Wis., November 9. He received his degree of bachelor of laws at Georgetown university, Washington, D.C. in 1896 and began legal practice in Washington the same year. In 1903 he joined the Northern Pacific Railway company and became successively a divisional counsel, assistant general counsel, general solicitor, executive vice-president, and president from Dec. 1, 1920 until his death on September 4 at St. Paul, Minn.

Douglas, William Orville (1898–), American jurist, was born at Maine, Minn., on October 16, the son of a Scotch Presbyterian minister. He graduated from Whitman college at Walla Walla, Wash., in 1920, and after teaching for two years in the high school at Yakima, Wash., he enrolled at Columbia university, where he was granted his law degree in 1925. He was admitted to the bar in 1926 and from 1925 to 1927 lectured in law at Columbia and was associated with a legal firm in New York city. In the latter year he went to Yale, where he was successively assistant, associate, and full professor, then Sterling professor of law. During Herbert Hoover's adminis-

tration, Douglas assisted the U.S. Department of Commerce for three years in analyzing bankruptcies. He was called to Washington again in 1934 to direct the Securities and Exchange Commission's investigations into bondholders' committees and reorganizations—in both of which subjects he was a recognized expert. When he became chairman of the SEC in Sept. 1937 he requested the New York Stock Exchange to undertake self-reform within six months or submit to closer governmental supervision. The Exchange chose the former course and relations between the energetic chairman and Wall street became more amicable. On March 20, 1939, President Roosevelt nominated Douglas as associate justice of the U.S. Supreme Court, to succeed Justice Louis D. Brandeis, who had resigned February 13. Douglas, who is the youngest man in more than a century to occupy the bench of the highest court, is co-author of two books on cases and materials on business units, also *Corporate Reorganization* (1931), *Losses, Liabilities and Assets* (1932) and, with C. E. Clark, *Case Book—Partnership* (1931).

Drama: see THEATRE.

Dress: see FASHION AND DRESS.

Drought. Those portions of the continents where drought expectancy is high—regions covering vast areas between the humid and arid climatic zones—produce an important part of the basic foodstuffs of the world, particularly grains and livestock. Large agricultural areas in these semi-humid and variable climates are found notably in the United States and Canada, Russia, Australia, India, Argentina and China. Serious rainfall deficiencies in these important grain and livestock regions have effects on the world markets for these commodities.

During 1939 droughts of some consequence occurred in several of these places at critical seasons. The year opened with a continuation in Australia of the exceptionally dry spring and record heat of summer which had prevailed in the latter part of 1938. In New South Wales, Victoria and part of South Australia it was expected that the wheat yield would be the lowest since 1914; there was an alarming loss of livestock and the supply of irrigation water for fruits was almost exhausted. Abundant rains toward the end of February ended the drought in most sections.

In the western winter wheat belt of the United States, especially in Kansas and Nebraska, the fall of 1939 was the driest on record. The winter wheat, which is planted early in the fall and is expected to germinate and start its growth before winter, had its development seriously retarded or completely failed to germinate in the dust of the prairie. Severe crop losses in the entire winter wheat belt except east of eastern Kansas and eastern Oklahoma were in prospect as the year ended. For the three months September, October and November, the lowest rainfall of record occurred in Nebraska, Kansas, Iowa, Illinois, Tennessee and Wisconsin. From the Rocky mountains eastward to Arkansas, Missouri and the upper Mississippi river and from northern Texas to southern Canada the precipitation for these three months was less than 50% of the normal. An area of similar deficiency extended in a narrow belt from Wisconsin through Illinois, southern Indiana, Kentucky and Tennessee to the Gulf of Mexico. The wheat region of eastern Washington experienced an equally severe drought.

During 1939 a serious summer drought occurred in western India, especially in the Punjab where the third successive year of moisture deficiency was experienced. More than 150,000 head of cattle were said to have died because of fodder shortage before late summer and fall rains brought relief.

In Argentina, drought was experienced during the growing season of 1938–39, most severe in the southern sections where the

crop of maize and wheat was in some places hardly worth harvesting.

Other, less widespread droughts were experienced during 1939 in the Shantung Province of China in the spring and in New York State in the latter part of the summer, particularly in the "southern tier" of counties where crops did not mature properly, and in the Piedmont region of Virginia, the Carolinas, and Georgia during the late summer and fall. (See also AGRICULTURE; DRY FARMING; DUST STORMS; IRRIGATION.)

(H. R. B.)

Drugs and Drug Traffic.

Under the immediately effective provisions of the Federal Food, Drug, and Cosmetic Act of 1938, a total of 266 court actions were instituted during the fiscal year 1939 by the Food and Drug Administration because of the shipment in interstate commerce of dangerous drugs, dangerous therapeutic devices, and dangerous cosmetics. Of these, 187 were seizures removing the dangerous articles from the market, and 79 were criminal prosecutions against the concerns responsible for violating the Act.

Among the drug products held to be adulterated because dangerous to health when used in the dosage, or with the frequency or duration prescribed, recommended, or suggested in the labelling thereof, were products of the pain- and headache-reliever type containing such potent drugs as cinchophen, aminopyrine, barbituric acid derivatives, and combinations of bromides and acetanilid, and obesity treatments containing desiccated thyroid. In one instance the manufacturer of an effervescent laxative by mistake substituted a poisonous substance, tartar emetic, for tartaric acid, for which the formula called.

Seizures were made to the number of 65 of interstate shipments of sight-destroying eyelash dyes containing paraphenyldiamine or related compounds. Criminal prosecutions were directed against the responsible shippers. Seizures of eyelash dyes containing ammoniacal silver salts and pyrogallol were accomplished. Other cosmetics deemed dangerous leading to legal action were skin-bleaching creams containing mercury compounds, lipsticks containing cadmium and selenium, and a mole remover consisting of acetic and nitric acids.

The Act of 1938 provides that no new drug shall be introduced in interstate commerce unless an application has been filed establishing that it is safe for use. Most of the new-drug applications describe new combinations of known drugs which will cause no direct public-health injury, although in many instances it is questionable whether they possess the therapeutic properties claimed for them. A few of the new drugs submitted are distinctly new and possibly highly valuable. The Act places a serious responsibility upon the Food and Drug Administration; no valuable drug should be unnecessarily withheld from use; the release of drugs without sufficient testing to establish their safety must be avoided. The Administration's responsibility does not end when an application is made effective. Continued observation is essential to insure proper uses and the early discovery of any harmful results which may require reconsideration of the decision to permit traffic in the drug.

Under the Federal Food and Drugs Act of 1906 which was in effect until June 25, 1939, criminal prosecutions to the number of 278 involving interstate shipments of drugs were instituted and seizures of drug shipments to the number of 538 were effected. Under the import sections of the Act 1,148 consignments of drugs were denied entry into the United States. Notices of judgment to the number of 475 involving drugs were issued during 1939. (See also LEGISLATION, FEDERAL: *New Federal Food, Drug and Cosmetic Act.*)

(W. G. CA.)

League of Nations.—Regardless of the degree of political ac-

tivity of the League of Nations, its drug work goes on. The Opium Section of the League Secretariat, the Permanent Central Opium Board, and the Opium Supervisory Body continue their valuable day by day work. The Opium Advisory Committee meets annually to investigate and report on existing conditions, to recommend action, to discuss illicit traffic cases publicly, and to ask any Government whose territory has been used as a base for illicit traffic to account for its stewardship. The Permanent Central Opium Board and the Opium Supervisory Body correspond with Governments, whether inside or outside the League, gather statistics, and perform their semi-judicial functions of regulating the lawful international traffic in narcotic drugs and imposing so-called embargoes when necessary.

Adherence to the various drug conventions is almost universal; 59 countries are parties to the Hague Convention, 53 are parties to the Geneva Convention of 1925, and 63 are parties to the 1931 Limitation Convention. The establishment of the system under the Geneva Convention of 1925 requiring Government certificates permitting import or export, and the limitation of manufacture under the 1931 Convention have proved to be the most important steps taken. The Geneva Convention of 1925 went a long way toward stopping licensed manufacturers and dealers from producing and selling narcotics for illicit purposes.

The 1931 Convention to limit the manufacture and regulate the distribution of narcotic drugs is working successfully. Under this Convention every country is expected to send to Geneva each year an advanced estimate of its next year's needs of each of the drugs. The supervisory body makes estimates for any country failing to do so. The Permanent Central Opium Board checks imports and exports continually against this list. If any country's imports exceed the estimates the Board notifies all Governments.

The results of the League of Nations' activities are evidenced by the reduction of the amount of morphine produced in licensed factories to the world's legitimate medical requirements. The production of heroin, the most dangerous of all habit-forming drugs, has decreased sharply. Cocaine production has dropped almost as sharply as heroin production. The estimated number of drug addicts in the United States has dropped from about 125,000 to less than 50,000. Similar reductions are reported from Canada and Egypt. France and Italy instituted prosecution against traffickers. Yugoslavia enacted new control legislation. Considerable progress was reported in areas in China under control of the Chinese National Government. As the dragnet tightens drug traffickers move from one country to another and set up secret factories in countries where control is weak or non-existent.

The unrestricted growing of the opium poppy and the coca bush are still serious international problems. The Opium Advisory Committee is elaborating a plan for limiting the production of the opium poppy plant.

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Drug Therapy: see MEDICINE: *Drug Therapy.*

Drunken Driving: see INTOXICATION, ALCOHOLIC.

Drunkenness: see INTOXICATION, ALCOHOLIC.

Dry Farming. A longer rotation for dry farming, with emphasis on maintaining vegetative covering on crop land, was recommended at the Agricultural Adjustment Administration's 1940 program-planning conference July 10 to 12, 1939, in Washington, attended by 100 State-farmer committeemen. Four years of work to rehabilitate the Dust Bowl of the United States high plains has progressed so far that good crops are being grown, and agronomists from other countries with wind-blown areas to protect have come to the United States to observe



STRIP FARMING as a measure of soil conservation is taught in the grade schools of Springfield, Mo., a centre of progressive education

the reclamation work. Among these visitors have been scientists from Australia, Canada, Palestine, China, South Africa, and Argentina. The Washington conference in July decided that the need had passed for a special program for wind-erosion areas. Reclamation procedure, which began five years ago with 26 demonstration tracts in the heart of the Dust Bowl, has been continuously expanded and consists of contour plowing and terracing, strip farming, reseeding of large grazing areas permanently in native grasses, construction of numerous ponds and lakes and the planting of thousands of seedling trees as wind-breaks. Contour plowing and terracing prevent washing and enable the soil to absorb and retain rainfall. Strip farming, in which crops with soil-binding root systems alternate in narrow strips with loose-root crops, prevents wind erosion. Wild life is reported to have increased substantially in the restored grass lands and about lakes and sloughs built to store run-off of rain-water. The Dust Bowl droughts of a few years ago are said by some meteorologists to have been caused by cyclical solar variability, recurrence of which, it is predicted, will cause another intense drought in 1975.

(S. O. R.)

Ductless Glands: see ENDOCRINOLOGY.

Dust Bowl: see DRY FARMING; DUST STORMS.

Dust Storms may or may not represent land damage, according to their source. In inhabited regions, they are likely to be the manifestations of soil erosion by wind on agricultural land. In generally uninhabited regions, such as des-

erts and scab lands, dust storms may represent only the aerial redistribution of soil particles from one locality to another, without any particular attendant damage.

In arid or semi-arid agricultural regions, such storms tend to follow the removal of vegetation which normally protects and ties down the soil. In desert regions and other areas of arid climate and scant vegetation, the storms are virtually seasonal occurrences. In regions of either type, however, they vary with the velocity of the wind and the intensity of drought. Thus, a combination of unprotected dry soil, wind and prolonged aridity normally may be expected to produce a dust storm.

On the North American continent, where some of the world's most severe and damaging dust storms have occurred in recent years, there were no major dust storms during 1939. Some local dust storms occurred throughout the Great Plains.

Severe prolonged drought, which was more severe than in the autumns preceding the disastrous droughts of 1934 and 1936, affected the region between the Appalachian and the Rocky mountains; September and October were the driest months on record over most of the Great Plains. In some sections of the Southern Great Plains, or "Dust Bowl," wells failed, streams dried up, pastures burned and crops were badly damaged.

With farmers applying proper cultural methods, no major dust storms are expected in the spring of 1940, since it requires several seasons of drought to render the soil incapable of resisting winds.

On May 11, 1939, a minor dust storm occurred in the New England region of the United States reducing visibility to five miles and sunshine to 50%. Following the long summer drought, a similar local dust storm occurred on Long Island.

In the pastoral regions of Australia, where the rainfall rarely exceeds 10 inches, soil blowing is a severe problem. No major dust storms were reported, however, for 1939; but local blowing was noted in several regions.

In Africa, wind erosion affects a few areas, the most notable being Nigeria, where the Sahara is reported moving southward owing to the deterioration of the forest by burning and overstocking.

The northern half of the Anglo-Egyptian Sudan, the Sahara and other arid or desert regions of Africa, as well as Iraq and similar desert regions of Asia, again experienced severe sand and dust storms. These were not unexpected, since such storms have become periodic in those regions. (See also AGRICULTURE; DROUGHT; DRY FARMING.)

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Dutch Borneo: see BORNEO; NETHERLANDS COLONIAL EMPIRE.

Dutch East Indies, the largest colonial possession of the Netherlands, consists of a huge archipelago, with several large islands, Java, Sumatra, Celebes, parts of Borneo and New Guinea, and many smaller ones, lying along the Equator from 6° north latitude to 10° south latitude, located south of the Philippines, south and east of the Malay peninsula and north of Australia. Capital, Batavia; governor-general, Jonkheer Dr. A. W. L. Tjarda van Starkenborgh-Stachouwer, appointed 1936. Area is 733,681 sq.mi.; population (1930) 60,731,025; estimate Jan. 1938, 65,000,000. The population (census, 1930) is divided as follows: Java and Madura, 41,719,524; Sumatra, 8,238,570; Borneo, 2,194,533; Celebes, 4,226,586; rest of the archipelago, 4,351,812. Largest cities: Batavia, 437,000; Surabaya, 373,000; Bandung, 167,000.

Education and Religion.—The great majority of the natives of the Dutch East Indies are of Malay stock and profess the Mohammedan religion. Educational statistics for 1937 were as follows:

Schools	Number	Teachers	Pupils
Public European primary schools	169	750	22,842
Private	108	697	22,505
Public Netherlands—Chinese	61	368	13,137
Private	45	282	10,392
Public Netherlands—Native	228	1,424	47,286
Private	112	965	24,500
Public 2nd class schools for natives	2,372	6,187	218,703
Private	248	672	22,350
Village schools	16,961	32,309	1,677,971
Public Mulo-schools	32	258	5,977
Private	26	178	3,938
Public secondary schools	11	309	4,509
Private	12	148	2,108
Government high schools	3	90	1,038

The cost of the educational establishment was between 26,000,000 and 27,000,000 florins.

In Java and Madura (1920) 6.5% of native males and 9.5% of native females could read and write.

Defence.—A colonial army of about 40,000, mostly natives with Dutch in the higher commanding posts, is maintained, together with a navy consisting of 2 light cruisers, 8 destroyers, 12 submarines, 2 gunboats, 5 minelayers, 8 minesweepers, 4 torpedo motor-boats, 1 surveying vessel and 1 training ship.

Finances and Banking.—The unit of currency is the Dutch florin (53.1 American cents in 1939). The Java bank is the bank of note issue for the Dutch East Indies and there are several other banking institutions.

Revenue in 1937 was estimated at 437,125,343 florins and expenditure at 461,564,145 florins.

Trade and Communication.—The trade of the Dutch East Indies in 1937 was valued at 963,507 florins for exports and 516,292 florins for imports. The Royal Netherlands Indies Airways during 1937 covered 951,300 mi., transported 21,150 passengers, 77,280 kg. of freight, and 29,660 kg. of mail. The Dutch East Indies, especially Java, is rich in natural resources and has been intensively and efficiently developed. Among the main products are sugar, petroleum, tin, rubber, pepper, quinine, oil palms, tea, and coffee. The sugar industry, despite its low costs of production, experienced a serious crisis because of the world-wide trend toward restriction of sugar imports; the output of sugar declined from 2,843,000 tons in 1931 to 638,000 tons in 1936, but rose to 1,414,500 tons in 1937. Mineral production in 1937 was as follows: tin, 39,793 tons; crude oil, 7,262,070 tons; natural oil, 1,140,999 tons; coal, 1,363,506 tons. (W. H. CH.)

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Dutch Guiana: see SURINAM.

Dutch Literature. True to the tradition according to which its culminating points in poetry, the year 1939, too, was rich in poetic production. P. N. van Eyck, who as the successor of Professor Albert Verwey now occupies the chair of Dutch literature in the University of Leyden, published a collection of poems *Herwaarts*, the first after a long period of silence. But it is especially the younger and youngest poets that attracted attention in 1939. To the former category belong the poets Mok, who published in rapid succession some epic poems of importance (*Exodus*, *Kaas-en broodspel*, *De Rallenwanger*); Van Hallum and Den Brabander. Others are younger; Van der Steen (*Controversen*) and Hoornik, who was awarded the prize for poetry of the "Maatschappij der Nederlandsche Letterkunde" (*Malthus*, *Geboorte*, *Steenen*). In connection with the work of this younger group that

of the poetess Clara Eggink (*Schiereiland*) should be mentioned. The periodical *Werk*, started in the beginning of 1939, also fostered a more outward consolidation of this group of young poets, a consolidation which will be continued by the periodical *Criterium* in 1940.

Side by side with poetry, the essay flourishes. Vestdijk, has published his masterly essays (e.g. on Emily Dickinson) in the important volume *Lier en Lancet*; also a new instalment of his autobiographical novel *Sint Sebastiaan*, and a collection of lyrical-epic fantasias: *Fabels met Keeurkrijt*. Some studies of larger scope have also appeared, namely a book about Shakespeare by Professor A. G. van Kranendonk, one on Diderot by Dr. Brugmans—a son of the lately deceased Amsterdam historian,—one on Chateaubriand by Professor Tielrooy, the two books by Du Perron about Meltatuli, and the posthumous volume by Professor Verwey about the great humanistic pioneer, Fred. van Eeden, well-known in England and America. Other works too bear testimony to Dutch humanistic culture: the important work of Professor Huizinga about the element of play in the development of civilization (*Homo Ludens*), the second work of the aphorisms of Dirk Coster, the first part of whose *Marginalia* has been translated into English too, the series of studies *Europeesche Gest* under the editorship of Dr. Banning and Dr. Bierens de Haan and *Antisemitisme en Jodendom* edited by the Amsterdam philosopher Professor Pos.

Most of the novelists of reputation added a volume to their output in 1939 with varying success. We select for special mention *Het vergeten gezicht* by Albert Helman; and the names of Arthur van Schendel, the uncrowned prince of contemporary Dutch fiction, of Antoon Coolen, Henriette van Eyck, Maurits Dekker (the first volume of whose trilogy on the prince of Orange has been translated into English), of T. Boudier-Bakker, Herman de Man, the Flemish novelist Walschap, the married couple Scharten-Antink. (A. Dr.)

Duveen, Baron (JOSEPH DUVEEN) (1869–1939), British art dealer and philanthropist, was born at Hull on October 14, the eldest son of Sir Joseph Duveen, who founded the firm of Duveen Brothers, art dealers. The son developed this business until it was recognized throughout the world as pre-eminent in its field. After his education at Brighton college, Lord Duveen was employed by his father as a "runner" to purchase works of art. He acquired an exacting taste and in 1906 astounded the world of art by purchasing the Hainauer collection of Paris for \$2,500,000. His purchase of the Rodolphe Kann collection, which included 11 Rembrandts, for \$5,000,000 in 1907 was a record sum for that day. His philanthropies were on the same large scale as his purchases and sales. Notable among his gifts were several large collections and a new building to the Tate gallery, a gallery of Italian paintings to the National gallery, and a new building adjoining the National Portrait gallery. He also helped defray the expense of moving Spanish masterpieces to Geneva during the civil war. Lord Duveen, who was created a knight in 1919, a baronet in 1926, and baron in 1933, died at London on May 25.

Dyestuffs. Statistics for the year 1937 represent the latest available figures of international production of coal-tar dyestuffs. A slight decline over 1936 was noted. This was primarily due to a decrease of 9,000 tons in Germany's output and a corresponding falling off in the production of dyes by Russia and Japan.

On the other hand, the manufacture of dyes in Great Britain and the United States has shown an upward trend, expansion taking place on a sound and permanent basis. The United States has become self-sufficient insofar as dyes are concerned, the annual

production representing approximately 90% of the domestic consumption. The needs of colour-consuming industries are ably taken care of despite the chaotic situation existing abroad.

Table I—Production of Dyestuffs, 1925-37

Country	Production in tons	
	1925	1937
Germany	72,000	63,000
United States	38,000	61,122
Great Britain	15,000	31,633
Japan	—	11,769
France	16,000	11,400
Switzerland	9,000	7,700
Other Countries	15,000	17,868
Totals	165,000	204,492

Intensified research is still directed toward the production of dyes possessing a greater degree of fastness. The range of vat dyes is being constantly added to, thus catering to the demand of the consumer and processor for faster colour. Dyeing methods are also being studied with a view toward simplifying the application of colour to various types of textile fibres and other materials.

Table II—Exports of Dyestuffs, 1937

Country	Tons	Value
Germany	42,400	R.M. 148,266,000
United States	8,350	\$6,250,000
Great Britain	5,728	£1,365,544
Japan	6,681	Yen. 6,269,000
France	4,728	—
Switzerland	7,113	Sw. Frs. 83,264,575

(A. G. B.N.)

Dyson, Sir Frank (Watson) (1868-1939), British astronomer, was born on January 8 at Ashby, England, the son of a Baptist minister. Educated at Trinity college, Cambridge, he became secretary of the Royal Astronomical society in 1899. In 1910 he was appointed Astronomer Royal, a position he held for 23 years until his retirement in 1933. See *Encyclopædia Britannica*, vol. 7, p. 819. He died at sea on May 25 while on a voyage from Australia to South Africa.

Ear, Nose and Throat, Diseases of. The voice is the chief consideration in the treatment of most laryngeal conditions, but in cancerous conditions it must be relegated to second place. During 1939 operations on the larynx were systematized and improved. Operations by means of direct laryngoscopy are performed on a number of small benign growths with resultant vocal restoration provided the underlying tissues have not been damaged or inflammatory states taken place.

Where cancerous growths are found within the larynx, especially on one or both cords and not attached elsewhere, the operation of laryngofissure is performed. This operation splits the thyroid cartilage and removes the intrinsic malignant disease without removal of the entire larynx. If one or both cords must be removed, a procedure which the laryngeal surgeon must often decide and perform, the results thereafter have been first class. The voice, too, in time returns even after the removal of one or both cords.

For cancerous states involving more than one cord, it may be necessary to remove the entire larynx (laryngectomy). Results for life are excellent, but it is interesting that these cases develop a voice; the mode of production, though different from the normal method, is based upon the same principle. Since the patient no longer has a pair of vibrators (the vocal cords), the collection of air in the lungs would not be of value in voice production. As soon as healing permits after the operation, the patient is taught to collect air in his hypopharynx, oesophagus, and stomach

to replace the air column from the lungs and to produce tone by means of vicarious cords formed in the hypopharynx or pharynx. It is important to remember that the "moulds of speech" (tongue, lips, cheeks, palate, etc.) form the words. The patients are given thorough training in the method of producing articulate speech by using the physiological rhythm of respiration. Occasionally they may try, if it is found necessary, a mechanical appliance known as the "artificial larynx."

Hygiene of Swimming.—Observations in past years revealed the fact that many swimmers developed sinus and ear infections, of varying degrees, and occasionally complications from these structures would take place in the mastoid bone, the meninges or brain. Investigators found polluted water in some pools.

H. Marshall Taylor conducted a series of researches with the following conclusions: 1. There are several factors other than water pollution that enter into the genesis of infection of the sinuses and ears during swimming. 2. Chilling of the body surfaces without concomitant exercise lowers the body temperature and lowers the white blood cell count (defensive mechanisms). 3. Man does not possess the mechanisms that aquatic animals are endowed with. 4. Man is a terrestrial animal. 5. Aquatic animals are able to prevent water from gaining entrance into the upper respiratory tract and external auditory canal, as well as to maintain a normal body temperature in cold water. Man is unable to do any of these because he does not possess the mechanisms therefor. 6. The manatee (*Trichechus*) closes its nose on submerging in the water. The hippopotamus can do likewise. The porpoise closes its blowhole on submerging, and the seal can close its nose and ears on submerging.

From his studies he offers the following valuable advice: 1. Man should not allow himself to be chilled, especially on the beach or swimming pool. He should be constantly active physically instead of sitting around in a cold wet bathing suit. Body temperature should be conserved by suitable wraps instead of allowing rapid loss of body heat by evaporation. 2. Water macerates the epidermis and since man cannot close his ears, he should put rubber ear stoppers or plugs of oiled wool or cotton in the ear canal while swimming. This will prevent external otitis, furunculosis and similar infections. 3. Diving should be performed skillfully. Diving feet first entails danger of the water rushing into the nares. The swimmer should inhale deeply through the mouth just before diving and then exhale slowly through the nose while under water. 4. Proper breathing is the only method that man possesses to protect the mucous membrane of the nasal passages when swimming. He should exhale through the nose while the head is submerged and inhale through the mouth while the head is above water. The positive air pressure in the nasal cavities protects the sinuses and the eustachian tubes from water.

Sulphanilamide.—Though it is true that patients with streptococcic mastoiditis got well without sulphanilamide, nevertheless this drug has proved immensely valuable. Maybaum, Snyder, and Coleman state that this drug has resulted in a genuine advance in the treatment of certain otogenous infections. They state that massive doses in the earlier stages controlled by determinations of the concentration in the blood have given them the best results.

Many reports of striking results have been obtained in meningitis due to streptococcic haemolyticus infection secondary to otitis media and mastoiditis by the adjuvant use of sulphanilamide. Neal, Applebaum, and Jackson state that during a period of more than 26 years they have had a recovery of only 15 cases out of 274. Nine of the cases which recovered had been due to the streptococcus haemolyticus. Since 1937, by using sulphanilamide along with tested procedures, they have had a total of 19 cases—14 recoveries and 5 deaths.

Surgical Treatment of Otosclerosis.—This disease is characterized by a progressive loss of hearing, particularly of the low tones, persistent tinnitus, absence of catarrhal or suppurative states in the nose, accessory sinuses and middle ears, and the usual findings of a normal drumhead (tympanic membrane) and a permeable eustachian tube. Though it may occur at any age, it has most often been first found in the young adult. Females are more predisposed than males. It is often hereditary. Pathologic investigations have revealed spongification of the bony capsule of the labyrinth followed by ossification (osteoporosis followed by osteosclerosis). The movement of the stirrup (stapes) is lost because of an ankylosis of its foot piece into the oval window (fenestra ovalis). The ankylosis may be due to ossification processes in the framework of the stapes, in the niche of the oval window, or both. Other focal sclerotic processes have been found in the bony capsule by many investigators.

Years ago Jenkins and Barany attempted a surgical approach to this problem, and they were led to conclude that an improvement in hearing could be obtained by making a new "window" (fenestra) in the bony capsule of the labyrinth. Later Holmgren and Sourdille performed a number of operations, using certain techniques that they themselves developed and perfected with conclusions of vast importance. Further observations of the operated cases at time intervals disclosed a gradual loss in hearing to the level before operation. Investigations and researches brought out the fact that the new "window" (fenestra) did not remain open but began to close because of bony regeneration. How to keep the "window" (fenestra) open remains the important problem, for closure of the fenestra by bony regeneration will lead to ultimate failure of the operation.

Julius Lempert of New York had undertaken the study of the surgery of the temporal bone. He developed and perfected a surgical approach and technique for instituting drainage in cases of acute and chronic mastoiditis. The approach differed from all others. He created a mobile window in the membranous and extracartilaginous portion of the external auditory which gave him an approach to any part of the temporal bone. It is technically termed the endaural, antauricular surgical approach to the temporal bone.

He continued his studies on otosclerosis with the view to developing certain fundamentals that might lessen the time factor in the complete operation as well as obtain a permanently open fistula of the labyrinth by mechanically preventing regeneration of bone. He set out, in his anatomic studies, and later in his operations on patients, to carry out the steps as he had created them. The result is his one-stage endaural plastic reconstruction incorporating the following principles: 1. The decompression and mobilization of the fluid beneath the bony capsule (the perilymph) by surgically constructing a trough-shaped fenestra ("window") in the bony capsule of the external semicircular canal. 2. The preservation of this surgically created mobility of the labyrinthine perilymph by replacing the removed area of bony labyrinthine capsule with a suitable and durable membrane which is inserted into the fenestra and maintained permanently in direct contact with the perilymph. 3. The arrest of the progressive labyrinthine venous stasis by decompression of the dura of the temporal lobe in the region of the epitympanic recess. This one-stage operation takes anywhere from three and a half to seven hours to perform and requires the utmost skill and finesse. Of the 23 cases operated on, practical improvement in hearing was obtained in 19, none in the remaining 4 cases. Of the 23 cases, the newly created fistula of the external semicircular canal remained open in 22.

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Earle, Ralph (1874–1939), U.S. rear admiral and educator, was born May 3 in Worcester, Mass., and graduated from the U.S. Naval academy in 1896. He was appointed ensign in 1898, commander in 1915, and rear admiral in Sept. 1930. He originated the mine field across the North Sea known as the Northern Barrage, plans for depth charges, and many other naval ordnance projects. In 1925 he retired as commander of the Naval torpedo station in Newport, R.I., to become president of Worcester Polytechnic institute. He died February 13 after an attack suffered while addressing Worcester students at chapel exercises.

Earthquakes: see DISASTERS; SEISMOLOGY.

Easley, Ralph Montgomery (1856–1939), U.S. political economist and reformer, was born at Frederick, Ill. on February 25. In 1900 he organized, in New York city, the National Civic Federation, of which he was executive chairman until his death. During his career he promoted conferences on a wide variety of topics, including taxation, the reform of primary elections, immigration, trusts, and the foreign policy of the U.S.A. He also organized the League for National Unity in 1917 and was author of numerous works on public questions. He died at Rye, N.Y., on September 7.

East Africa, British: see BRITISH EAST AFRICA.

Economic Association, American: see AMERICAN ECONOMIC ASSOCIATION.

Economic Geology: see GEOLOGY.

Ecuador, a South American republic situated astride the Equator on the Pacific; language, Spanish; capital, Quito; provisional president, Dr. Carlos Arroyo del Rio (resigned Dec. 11, 1939), A. F. Cordova. The area, including the Galápagos Islands (2,400 sq.mi.), is 337,392 sq.mi., according to Ecuadorean claims, but over 100,000 sq.mi. is disputed with Peru. Population (1935 est.) is 3,414,106. The chief cities are: Quito, 140,000; Guayaquil, 120,000; Cuenca, 42,000; Riobamba, 21,200.

History.—Throughout 1939 internal disorder threatened in Ecuador. In January and in March minor disturbances attributed to leftist elements and accompanied by strikes were suppressed. Again in July, a revolutionary outbreak was thwarted when the Government arrested several prominent political and military figures. Moderate tension continued through the year. Meanwhile,

on January 15, under the constitution of Dec. 1938, congressional elections were held. In them women voted for the first time. The new congress convened February 2 and confirmed Dr. Aurelio Mosquera Narváez in the presidential office to which the subsequently dissolved constituent assembly of 1938 had named him on December 2, but rejected the constitution approved by that body. In March, when it was proposed in the United States Congress that the United States purchase or lease the Galápagos islands for use as part of the Panama canal defences and to prevent their seizure by any European power, there was great indignation throughout Ecuador, and in May the Government formally and absolutely disavowed the proposal. Upon the outbreak of the European war, Ecuador declared her neutrality and, on October 20, in general accord with the Declaration of Panama (*See HISPANIC AMERICA AND THE EUROPEAN WAR*), proclaimed the neutrality of a zone extending 500mi. westward from her shores and including the Galápagos islands. War conditions caused a sharp retail price rise of 10% to 20% in Ecuador, and at the same time a decline in agricultural prices, with consequent economic ill effects. On November 17, President Mosquera Narváez died, and Dr. Carlos Arroyo del Río, president of the Senate, succeeded as provisional president. In conformity with constitutional requirement, he called a presidential election for Jan. 11, 1940, and subsequently announced his own candidacy. Other candidates included Dr. Jacinto Jijón y Caamaño, leader of the Conservative party, who left Los Angeles, Calif., in December to take part in the campaign, and former president José María Velasco Ibarra.

Education.—Ecuador has 2,239 elementary schools (enrolment over 180,000), 21 secondary schools, and four universities (at Quito, Guayaquil, Cuenca, and Loja).

Army and Navy.—Ecuador has an army of around 7,500 men, and a national police force of 3,500 for maintenance of internal order. Military service is compulsory.

Finances.—The monetary unit is the sucre (value: approx. $6\frac{1}{2}$ ¢ U.S.). The 1940 budget calls for 113,050,000 sucres, a 20% reduction in spite of the decline of the sucre.

Trade and Communication.—External communication is by sea (almost entirely through Guayaquil) and north and south by air. Railway mileage totals over 600 miles. There are approximately 3,000mi. of highways, with around a third of the 1,090km. Inter-American highway link through Ecuador still under construction.

Imports and exports in 1938 rose in terms of the sucre, due to its fall in international exchange, but fell in volume and in dollar value to \$11,064,000 and \$12,614,000 respectively (\$11,980,000 and \$14,928,000 in 1937). Imports (foodstuffs, machinery, textiles, and other manufactured goods) came largely from the United States (34.6%), Germany (24.1%), Great Britain (7.7%), Japan (7.4%), and France (4.4%). Exports (cacao, gold, oil, and coffee) went chiefly to the United States (37.5%), Germany (17.5%), France (8%), and Great Britain (4.6%). Cacao is the principal export commodity. Oil is also important. In 1939 Ecuador produced 2,265,000bbl. (est.) of oil (2,249,740bbl. in 1938 and 1,617,000bbl. in 1934). (L. W. BE.)

Eden, (Robert) Anthony (1897–), British statesman, was born June 12 and was educated at Eton and at Christ Church, Oxford. After service in the World War (1915–18), he contested the Spennymoor division of Durham in 1922, and in the following year he was elected for Warwick and Leamington, which he thereafter continued to represent. From 1926 to 1929 he was parliamentary private secretary to Sir Austen Chamberlain. He then became under-secretary for foreign affairs and, in 1934, lord privy seal and a privy councillor. In June 1935 he entered the cabinet as minister without portfolio

for League of Nations Affairs, holding this post until the following December, when he succeeded Sir Samuel Hoare at the foreign office. His tenure was marked by an ardent championship of the League of Nations and by progressive loss of confidence in the German and Italian Governments. Disagreement with the prime minister on the latter score led to his resignation on Feb. 20, 1938. Eden, however, refrained for the most part from attacking the Government for not seeing eye-to-eye with him on the best methods of negotiating with Hitler and Mussolini.

Late in 1938 Eden made a visit to the United States, where he received a friendly welcome in New York city and declared in an address there on December 9 that Britain would never surrender its democratic ideals and would not ask the help of other nations in protecting them. After July 1939 there were persistent rumours that he would re-enter the cabinet, and on September 3 he was appointed secretary for the Dominions, without a seat in the war cabinet but presumably with intimate access to its deliberations. He was then chosen to deliver the British reply to Germany's efforts (voiced especially in a speech by Goering on September 9) to persuade France to make a separate peace after the conquest of Poland. In an international broadcast on September 11 Eden declared that "there can be no lasting peace until Naziism . . . is banished. . . ."

Edison, Charles (1890–), U.S. Secretary of the Navy, was born at Llewellyn Park, West Orange, N.J. on August 3, the son of Thomas A. Edison. He was educated at Massachusetts Institute of Technology and in 1913 joined his father in business and research. As president of Thomas A. Edison, Inc. he directed the many corporations set up to manufacture and distribute the products invented by the elder Edison. He was appointed Assistant Secretary of the Navy by President Roosevelt Nov. 17, 1936, and became Acting Secretary upon the death of Secretary Claude A. Swanson July 7, 1939. Previously he had been assistant to the administrator of the NRA and regional director of the Federal Housing Administration. Roosevelt appointed him Secretary of the Navy on Dec. 30, 1939.

Education. The educational literature of the year 1939 was marked by an unusually vigorous emphasis upon the place of education in American democracy and on the responsibility of education for defending and advancing the ideals of American democracy. The contest for public taxes grew more intense than formerly. In addition to the drastic cut in the school program in New York State, other States showed a tendency to encroach on the public school dollar, under the pressure of increasing demands for appropriations for relief, old-age pensions, social security, roads and other public services. Educational leaders throughout the U.S. were frightened at these demands, as worthy as they may be, and were afraid that the schools would be crippled. The question that agitated some of them was: "Which is more important, the care of the old people or the education of the children?" Attracting notice also were the continued decline in elementary school enrolments, increased enrolments in secondary schools and in higher educational institutions, continued interest in the revisions of curricula, the growth of the junior college movement, the expansion of vocational education and of adult education and the increase in the number of adult forums, a decline in the pressures for loyalty oaths for teachers, an increase in the strength of opinion in regard to the tenure and retirement of teachers, and the creation in the Office of Education in Washington of a Guidance Division and the placement of that division in the Federal Security Agency.

Congress on Education for Democracy.—This unique convention was held at Teachers college, Columbia university, New York



GIRL TUMBLERS of the Oakdale, Calif., Union high school made a lengthy and successful tour of the Pacific coast in the spring of 1939

city, August 15, 16, 17, 1939, and attracted considerable notice. It brought together educators and laymen, who were representative of many phases of American life, to consider and discuss the question of the responsibility of education "for the defense and advance of democracy." There were many general meetings and about a score of seminars. A report on the discussions and recommendations of the seminars was made at the closing meeting of the congress. One of the recommendations called for the appointment of a "Continuation Committee to consider the results of the present Congress and to prepare specific plans for further activities." It was also recommended that such a committee should consider how to "collect the crucial problems of American democracy and how to get adequate information in relation to them."

Institutes on Professional Relations.—During the summer of 1939 more than 30 higher educational institutions from the Carolinas to Oregon co-operated with the National Education Association and their respective State education associations in "institutes" on professional relations. A representative of the National Education Association worked with these institutions and associations in the organization of the institutes, which were attended by a large number of people engaged in educational work. The National Education Association also sponsored several radio programs over national networks. President Amy Hinrichs, of the National Education Association, announced the appointment of a committee of that organization to co-operate with the American Legion on educational matters. At the San Francisco convention of the National Education Association the name of the "Department of Secondary Education" was changed to "Department of Secondary Teachers." Three new departments were created: the Department of Garden Education, National Association of Journalism Directors, and National Association of Teachers of Speech.

The American Federation of Teachers, at a meeting at Buffalo in Aug. 1939, adopted a unanimous resolution which endorsed the "progressive policies of the national administration in regard to education and labor." It also asserted that the report of Presi-

dent Roosevelt's Advisory Committee on Education had served to arouse wide interest in and support of Federal aid for education. Interesting also were resolutions of the organization urging freedom of teachers to present and discuss "relevant materials of a controversial nature" and the freedom of the teacher "to live his personal life and conduct himself in private with the freedom accorded other citizens." Professor George A. Counts, of Teachers college, Columbia university, was elected the new president of the Federation.

During the summer of 1939 several "Workshops" in the field of secondary education were conducted in a number of institutions in various parts of the U.S. All of these enterprises, except the workshop of the Southern Association of Colleges and Secondary Schools, conducted at the University of North Carolina, were carried on in co-operation with the Committee on Workshops and Field Service of the Progressive Education Association.

School and Society.—Early in Sept. 1939 announcement was made that *School and Society*, one of the most important American educational magazines since the early 20th century, was to be published by the Society for the Advancement of Education, a non-profit organization formed to maintain and promote that journal and to "foster other related enterprises designed to advance the interests of education." Distinguished American educators were named as trustees of that organization. The general editorial policy of *School and Society*, founded in 1915 and edited since that time by J. McKeen Cattell, will not be changed. But the magazine is now to be edited by William C. Bagley, who in August retired from a long and distinguished service as professor of education in Columbia university.

The Regents' Inquiry.—The completion of the Regents' Inquiry into the Character and Cost of Public Education in the State of New York, and the publication of numerous studies by the inquiry attracted considerable attention throughout the U.S. This survey constituted a most comprehensive examination of education in that State. Owen D. Young was chairman of the special committee of the inquiry, which began several years ago. Luther H. Gulick was director and Samuel P. Capen was associate director. Staff members were drawn from many institutions throughout the U.S. During 1939 there was wide discussion of the findings, in which the regents hoped that "The State of New York and its independent school communities may thus continue to make their contribution to the advancement of education for American life." Each of the "Studies," which the inquiry published, contained significant findings and made specific recommendations in the respective fields treated. It was found that there were in the State of New York 8,000 school districts, some of which had the same metes and bounds as were given them under an act of 1812, nearly 19,000 school officers, about 82,000 teachers, about 2,000,000 pupils, more than 5,700 one-teacher schools, expenditures for schools (1935) more than \$277,900, school properties valued at \$1,000,000,000, State educational aid in the amount of \$120,000,000, 18 subjects in the elementary school and 63 in the secondary schools. In the light of increasing competition among the 1,700 or more higher educational institutions in the United States were two interesting recommendations of the inquiry. One was to amend the law so as to limit "very rigorously incorporation of further independent general arts colleges and universities." The other was to extend the secondary school program beyond the twelfth grade, in the direction of the establishment of junior colleges at public expense. The Educational Policies Commission continued its activities and issued valuable publications. Among these was *Social Services and the Schools*, which defined the sphere of educational service and proposed policies with regard to schools, public health, public welfare, recreation and libraries. Important also was an activity of the commission which was inaugurated in

July 1939, to study ways in which the school can develop in young people intelligent and active loyalty to democratic ideals. In September the commission issued its report on *Federal Activities in Education*, the most comprehensive statement made since the National Advisory Committee on Education made its report in 1932.

Federal Aid.—The hope of many educational leaders that the congress would make early and considerable progress toward carrying into effect the recommendations of the President's Advisory Committee on Education in regard to Federal aid for education was not as lively at the end as at the beginning of 1939. The Harrison-Thomas bill (S.1305) and the Larrabee bill (H.R. 3517) carried over into the third session of the 76th Congress with the exact status that they had when the first session adjourned in August. The Senate bill was ready for a vote by the Senate, having been favourably reported in the first session by the Senate committee on education and labour. The House bill awaited a hearing by the House committee on education.

The Commission on Teacher Education of the American Council on Education began a "cooperative study of teacher education," which involved 20 higher educational institutions and 14 school systems and groups of school teachers. This commission was formed in 1938 to conduct a study of this subject for a period of five years. Carl W. Bigelow was made director of the study, the purpose of which is to encourage the rapid passage into practice of the best knowledge available concerning the education of teachers in the United States. The commission also seeks to stimulate experimentation with programs of the education of teachers and the growth of teachers in service. The commission held a conference at Bennington college, Vermont, in Aug. 1939, attended by more than 100 people who represented many groups who are engaged in the work of the education of teachers. The Cooperative Study of Secondary School Standards completed its work during 1939 and offered its publications to secondary schools, to libraries, to teachers of courses in secondary education, and to State, regional, and national groups interested in materials for the improvement of the work in secondary schools. The sum of approximately \$200,000 was expended by this study during the years 1936-39 "in the development and refinement of these materials," which were carefully tested in 200 secondary schools of all sizes and types throughout the United States.

Division of Cultural Relations.—This division was established in the Department of State under a departmental order issued by Secretary Cordell Hull in July 1938, for "the purpose of encouraging and strengthening cultural relations and intellectual co-operation between the United States and other countries." The functions

of this division are under the general supervision of the under-secretary of State and in very close co-operation with the geographical divisions of the United States. Ben M. Cherrington was appointed chief of this division. The National Committee on Science Teaching, sponsored by the National Education Association through its Department of Science Instruction, with other national bodies co-operating, began its work of improving instruction in science in the schools of the United States. Broad participation of the science teachers of the nation, working in co-operation, was sought. Two district meetings were held during the summer of 1939, one in San Francisco and one in New York, and another meeting was held in Chicago in October. The Committee on Salaries of Teachers of the National Education Association held several meetings during 1939. A major activity of the committee was the preparation of a preliminary work on a handbook of principles on teachers' salaries and salary scheduling, and a summary report of opinions of the advisory committee in regard to policies of salaries was issued in June. This summary reveals wide differences of opinion on certain issues on that subject, but it is believed that these differences can be eliminated by conference.

A two-year study of College and University Education for Negroes was undertaken, to be conducted by the United States Office of Education. Fred J. Kelly, chief of the Higher Education Division of that office, and Ambrose Cliver, specialist in the education of Negroes, were named director and assistant director, respectively. For this study Congress had appropriated \$40,000. The

GRADE-SCHOOL CHILDREN of West Dallas, Tex., established their own "court of justice" in the spring of 1939 to try violations of playground rules



first meeting of the advisory committee, which consists of a score or more specialists in the subject, was held in Sept. 1939. The importance of the study was emphasized by the decision of the Supreme Court of the United States in the *Missouri Case* in 1938.

In this case the court held that a Negro citizen of Missouri must be admitted to the law school of its university, unless facilities equal to those in that institution were provided for him elsewhere in Missouri. This decision affected 17 Southern States which, under their constitutions and laws, have long followed a policy of separation of the whites and Negroes in schools. Some of those States undertook to make a beginning during 1939 to meet the demands of that decision, one of the most significant decisions affecting education in the United States in many years. A unique effort to provide graduate and professional work for Negroes was made in the North Carolina College for Negroes at Durham, where Duke university is located. Several members of the faculty of that university and several members of the faculty of the University of North Carolina, located 12 miles away, began in September offering graduate courses in the North Carolina College for Negroes, and this co-operative work will continue until that institution is able to provide its own graduate staff. (See also *ACADEMIC FREEDOM; UNIVERSITIES AND COLLEGES.*)

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(E. W. K.)

British Empire.—The tendency towards educational reform in the British Commonwealth is increasingly evident. In those Dominions where education was traditionally looked upon as a matter of local or provincial interest a national outlook has been gradually formed, followed by reorganization of administration and finance within the provinces or states, and centralization of supervision on a national basis. In New Zealand, on the contrary, the same aim led to the strengthening of the local authorities. The diverging systems of the four Dominions, Canada, Australia, New Zealand and South Africa, aim at a balance of central and local control which was achieved in England after a long historical process. This community of ideas is noticed in other aspects of education as well. The differentiation of post-primary education with adaptation to local needs, the development of new "activity" methods, the promotion of physical culture, the introduction of broadcasting services into the school and the growth of medical service are typical features of recent advances common to Great Britain and all Dominions.

Canada.—The opinion of provincial departments is definitely moving towards national conception of Canadian education and Federal grants as means to the end. The Royal Commission on Dominion-Provincial Relations is expected to publish a relevant report soon. The Federal-Provincial youth-training project, in 1939 had over 15,000 young people in courses for rehabilitation. The Canadian Council for Educational Research was founded by the provincial departments, the Canadian Teachers' Federation with assistance from the Carnegie Corporation, New York.

In Ontario, the consolidation of small rural schools is continued.

In 1938-39, 27 more schools, and 68 rural schools were united into 14 districts. In Quebec, the French Canadians completed the reform of normal schools. The Catholic religious normal schools now require the same qualifications as the lay schools. In Nova Scotia, various types of school administration were examined. In Prince Edward Island, compulsory age was raised from 13 to 15 years. In Manitoba, the special commission on revision of programs continued its work. More emphasis would be laid on "activity" methods. In Alberta, approximately 90% of all rural schools have now been reorganized into 44 school divisions. In British Columbia, the revised programs for high school grades were introduced in 1938-39.

Australia.—The Commonwealth Government has departed from its previous policy of non-intervention in education. It is now awarding grants in aid of rehabilitation and training schemes for unemployed youth. All six States submitted schemes which were approved by the Commonwealth Government and are now administered by the States. Pre-school child development centres have been established in the six capital cities. In New South Wales, many reforms are under consideration. In technical education increased facilities were made available by the building of several new technical colleges. In Victoria, a reform movement similar to New South Wales has been organized. A new technical school was opened at Preston and a new Food Trades school with accommodation for 1,350 students is under construction in West Melbourne. In South Australia, a consolidated central school has been established as an experimental rural school for post-primary children. A considerable advance was made in the use of visual education.

In Tasmania, the development of "area schools" continues. In 1939 four more were added.

New Zealand.—The bill introduced in 1938, the main purpose of which was to strengthen the local education authorities, is still in the committee stage but the restrictions on the employment of married women have been repealed, the Council of Adult Education established, and grants to education boards increased. The consolidation of rural schools is now going on more rapidly; and agricultural clubs number well over 15,000.

Union of South Africa.—In 1939 the National Bureau of Educational and Social Research published the first issue of the "Bulletin of Educational Statistics." A national, Union outlook in education is now transcending the provincial differences. The education of abnormal children has become compulsory, the responsibility being divided between the Union and the provinces. In the Cape province medical service and physical culture training have been extended. At three agricultural schools handed over by the Union Government courses were especially adapted to farming needs and in 11 primary schools curricula have been changed to suit the rural or industrial occupations of respective communities. In Transvaal, the centralization of rural schools around one farm school continued, resulting in the elimination of about 100 small schools. The number of pupils continuing their studies beyond the primary stage increased to 63%. In the Orange Free State, the

first report of the vocational guidance officer emphasized the necessity of differentiated post-primary education. The necessity of academic education for all European children was emphasized.

Eire.—A consultative council of education has long been desired by the Irish National Teachers' Organization. In 1939 the Commission on Voca-

Number of British Commonwealth Scholars in 1937-38

Country	Population 5-20 years in 000	In elementary schools	In secondary schools	In vocational schools	In private schools	In universities and colleges	Percentage of total scholars to pop.
ENGLAND & WALES	9,530	5,091,975	470,003	1,361,310	400,000	91,258	78
SCOTLAND	1,200	629,315	156,645	174,151	14,000	19,037	83
NORTHERN IRELAND	340	196,839	13,683	22,368	3,000	1,609	70
CANADA*	3,250	1,709,833	307,651	81,976	108,775	92,798	73
AUSTRALIA*	1,866	828,648	102,170	87,604	240,146	10,781	69
NEW ZEALAND	400	211,708	25,708	25,517	34,114	5,707	76
SOUTH AFRICA (Europeans)	500	321,199	59,975	32,378	26,288	9,492	76
EIRE (Ireland)*	860	481,599	35,890	33,521	2,034	5,745	69
BRITISH INDIA*	97,740	11,276,527	1,456,420	268,532	701,072	115,224	14

*For 1936-37.

tional Organization was appointed, which is investigating the establishment of "functional organization" and the "rights and powers" which should be conferred on such a body. The language policy of the Government continued to make progress, especially in the secondary schools. In 1938 about 10,000 pupils earned the grant given to pupils who speak Irish at home. A new Gaelic hostel for children was opened in county Meath. The Institute of Mathematical Research was inaugurated by the prime minister in 1939. The experiment of raising the school-leaving age from 14 to 16 years showed good results.

British India.—An improvement in educational services has been noticeable during the past two years in an increase of enrolment in the upper forms and considerable increase in female enrolment. In Bombay the revised syllabus of primary schools, which is more practical and child-centred, was adopted by the provincial committee. The Committee on the Training of Primary Teachers recommended the raising of standards and the establishment of special vernacular three years' secondary schools (after seven years of primary education), the so called *Lokshala*, which should serve as preliminary stage for training colleges. In Madras decentralization was marked. Lower classes of secondary schools were abolished in 1938-39. One-teacher schools were reduced in number by 3,000. In Punjab some districts have abolished small schools altogether. Compulsory attendance under the present conditions has so far failed to produce the desired result. In the United Provinces a provincial committee is considering the reorganization of the school system to incorporate the middle schools into the elementary stage thus providing complete non-academic education. In the Central Provinces and Berar there is a noticeable increase of enrolment of depressed classes, but decrease in numbers of aboriginal hill tribes. The prevalent unemployment among educated classes is being studied.

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General World Trends.—It would be difficult to overemphasize the influence that the European war has already had upon education and will in all probability continue to have during the year 1940. It has disrupted education in the belligerent countries and has profoundly influenced the attitude towards education in non-belligerent countries. The need of evacuating schools in big cities like London and Paris because of fear of air raids and in possible combat areas like Alsace and the Rhineland resulted in the movement of millions of children to rural districts, causing profound changes in educational methods and community life that will probably be emphasized during 1940. With the exception of London and Strasbourg, the universities of Great Britain and France opened their doors as usual. Germany closed all the universities save five. In all these countries, however, university education was conducted upon a reduced scale. Students were mobilized, professors called upon for particular kinds of service, courses of a more limited nature offered. In the countries where mass fighting has taken place, Poland and China, education has been practically destroyed. The aggressor countries, Germany and Japan, have reduced to ruins schools and universities, and neither Germany in Poland nor Japan in China has any desire to reconstitute education. In the parts of China still controlled by the National Government makeshift schools and universities have been established. Obscurantism and regressive policies which flourished in the totalitarian countries during 1939 will in all probability flourish during 1940. The very word "totalitarian" implies that the State is to decide in *all* things: what its people shall read in the newspapers and hear over the radio, whether its authors shall be permitted to publish books containing views not favoured by the State, or cinema companies show pictures disliked

by the State, or private organizations carry on activities dis-trusted by the State.

The great enemy of democracy, Germany, has continued to emphasize the doctrines of Aryan superiority and race solidarity. Aryan superiority and race solidarity mean the exclusion from Germany of all alien elements like the Jews who are now excluded from all education except what they can supply themselves. Recent regulations of the ministry of education provide that the Nazi Party alone will determine who may attend the universities. The regulations also reduce the length of vacation, insist upon the importance of practical and technical subjects, and in every way emphasize that university education is not to be determined by the preference of the individual but by the will of the State. The German view of the place of education in the State has had a profound influence upon education in every other totalitarian country with modifications determined by conditions. Japan does not hold to Aryan supremacy but she does, as do all other totalitarian countries, hold to race solidarity. Moreover, anti-liberal views on subject matter, old-fashioned methods of teaching and rigid discipline have almost everywhere accompanied the appearance of totalitarianism in any country, e.g., Spain.

Wherever German influence has extended, as in Italy and Japan, anti-Semitism in the schools has accompanied it, resulting usually in the expulsion of Jewish teachers and scholars. It will be a long time, if ever, before Jews will regain the place of eminence they have hitherto held in the intellectual life of totalitarian countries. In Italy the Grand Council of Fascism has promulgated a new Charter of the School providing for a complete reorganization of education. Compulsory school attendance begins at four and continues to 14. The practical subjects are to receive increased attention and the classical subjects less. The fact that education is exclusively for purposes of the State is everywhere emphasized. The implementation of the Charter of the School was postponed because of the European war. In Soviet Russia there has been a great emphasis upon nationalism and patriotism instead of socialism as necessary for the defence of the "Socialist Fatherland." An increased emphasis upon nationalism and patriotism will undoubtedly be made in 1940.

The democracies have not remained unaffected by the events of 1939. In every democratic country there has been a resurgence of faith in democratic institutions and a determination to safeguard them. This attitude has been reflected in the school. Criticism of most aspects of the school, its organization, curriculum, discipline, examinations, has been prevalent. The demand is that the school must be made a more efficient instrument for preparation for life in a democracy. But the ideal everywhere emphasized is the individual student as a future citizen having definite duties toward the State. (S. D.N.)

Nursery Schools.—The latest U.S. Office of Education survey, made in 1936, lists 285 of the permanent type of nursery schools. This is a minimum figure since many fail to report. Of these, 51% are in full-day, and 49% in half-day session; 50% are supported by tuition, 27% by universities, 19% by philanthropic organizations and 4% by public schools. The typical age range is two to five years. In addition to the primary service given children, schools function as centres for research, teacher training, parent education, and, in public high schools, as centres and laboratories for pre-parental training in child care and family relations. The high professional training of nursery school workers is shown by the fact that 31% have bachelor's and 41% master's or doctor's degrees.

In 1939 both housing authorities and welfare agencies were much concerned with the type of service they gave young children and in some instances included nursery facilities in their planning. In recent years many day nurseries have been converted into

nursery schools with trained staffs. The outstanding program of the Works Progress Administration has continued at the level of 1,500 emergency nursery schools with 45,000 children enrolled. State and local contributions to their maintenance are increasing. (See also EDUCATION, ADULT; EDUCATION, ELEMENTARY; EDUCATION, PROGRESSIVE; EDUCATION, SECONDARY; EDUCATION, VOCATIONAL.) (J. E. A.)

Education, Adult. Paradoxically, the greatest progress in recognition by the public of the close interdependence of adult education and democratic processes has occurred in a year in which open armed warfare against democratic ideologies has broken out. During the first eight months of 1939, the high importance of the education of mature persons to the functioning of democratic self-government in the nations still adhering to such systems has been emphasized again and again by statesmen and educators. Two weeks before the outbreak of war, Earl Baldwin of Bewdley, speaking before a world Congress on Education for Democracy assembled by Teachers college, Columbia university in New York, affirmed that a democracy could only be as strong in its faith as the education and understanding of its citizenry afforded. This view was also stoutly expressed by the many educators and laymen participating, all of whom evidenced the increasing extent to which the democratic peoples were relying upon adult education for the protection of their institutions, their culture, and their way of life. By and large, the world movement for adult education has suffered serious losses in 1939. In addition to the belligerent nations, in which educational activity perforce gives way to war activities, the strong movements in Czechoslovakia and Poland, like that in Austria in the preceding year, have been laid waste by the invader. Their replacement by the propaganda agencies of the conqueror reduces their scope to less than the avowed adult education activities of the totalitarian states, Germany, Italy and Russia, in which party propaganda for "solidarity" masquerades under the name of adult education.

In the Scandinavian countries including Finland, adult education continues to function with extraordinary effectiveness, though in imminent danger of engulfment by the exigencies of war nearby. Evidence is at hand that the Chinese mass movement for literacy has proceeded effectively in those portions of the country not occupied by Japan. In Japan itself, the necessities of a war program have cut down both the funds and the time formerly devoted to a growing adult education movement. In India, steady progress in the fields of health education and literacy is reported, although the enormous size of the problem indicates that only the surface has been scratched. Some advances are also noted in South Africa, though little has been done for the native populations.

In the British Commonwealth of Nations, adult education expanded and improved during the year, although the effect of the war declarations undoubtedly will be to reduce the emphasis and perhaps to suspend many of the activities. In England the British Institute of Adult Education has served as consultant for a number of social organizations planning their programs. A study has been made of social settlements, the result of which will be to place these agencies definitely in the educational field. In co-operation with the American Association for Adult Education, the British Institute is participating in an international study of radio listening groups. A correspondence instruction service for British sailors has been devised under the attractive title of the "College of the Sea." Australia is in the process of setting up a system of agricultural extension similar to that of the United States. The war may well accelerate this movement. The Australian Workers' Educational Association has established a flourishing system of discussion groups for working men and their families. In Canada, a well organized adult education movement,

under the leadership of the Canadian Association for Adult Education, has made itself a potent force in each of the nine Provinces of the Dominion.

In the United States, the movement has redoubled its efforts to protect the freedom of adult education institutions in a difficult time of official neutrality. The American association has brought to a pause its series of studies on the social significance of adult education, a score of volumes having been issued with some seven or eight remaining to complete the series. The Congress failed to pass legislation introduced for a Federal subsidy to adult education. Curtailments in the amount spent by the Government for relief have induced severe cuts in the program of the adult education division of the Works Progress Administration. Certain of this work has been absorbed by the local school systems, but on the whole the Government action has resulted in a diminution of the amount of free public adult education. Correspondingly, the demands made on the private voluntary agencies have increased. A steady growth in the number of adult education councils is noted, together with an increase in the number of regional conferences sponsored by the national association. Adult education sessions are included now in most of the convention programs of national organizations whose work includes educational activity. A first conference on Adult Education and the Negro, held at Hampton institute, has resulted in increased activity among members of this race. Educators, librarians, and publishers are concentrating on problems surrounding the preparation and distribution of simple, readable materials for adult instructional purposes. The first large scale effort of this nature made its appearance in 1939 under the name of the Peoples' Library. Volumes in this series were prepared in the Readability Laboratory at Teachers college, under the sponsorship of a committee of the American association.

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Education, Elementary. The most significant present trend in elementary education is the growing tendency to view education as a social process. This emphasis is not simply a stress upon education for social purposes, nor is it merely a recognition of the contribution of the culture to individual development. It is not merely the relation of school to community. Rather it is all of these combined against the background of a philosophy which emphasizes the integral character of life, education, and society. It is only as one sees all phases of education in relation to this integration that the significance of the movement becomes apparent.

For example, education for citizenship is no new emphasis. But as it has been conceived in the past, education for citizenship is one thing and citizenship itself is another. Under the emerging trend this dualism is eliminated. The child is a citizen now. His education is the practice of good citizenship. It is life itself. Thus the criteria for activities educational are the criteria for the good life. We can have no effective education for citizenship without opportunity to practice that citizenship now. In fact, we secure no meaningful education at all unless citizenship is involved or is practiced.

Similarly it is not new to emphasize the contribution of the racial heritage to the educative process. It is in fact very old. Moreover, it is to a misconception of this contribution that many educational ills can be traced. Older concepts of education held the mastery of the racial heritage to be the aim of education. In the present trend the aim is individual and social development with the culture in the position of a means. If the individual is subordinated to the culture, enslavement ensues and creative potentialities are destroyed. Simultaneously uniqueness

and individuality flower through vital interaction between a developing personality and the culture. There is thus no conflict between the aims of individual development and the contributions of the culture when they are viewed in the integral relationship here assumed.

Also the artificiality characteristic of school and community relationships disappears in the new school. Here is no thought of selling the school to the community; nor of school domination by the community. The school is not using the community merely as a tool or device, nor does the school lend itself to this or that design on the part of the community. Individual growth and community development are merely different phases of an integral process.

Conceived in the above terms the elementary school avoids the sterility of the old school. Simultaneously it finds an appropriate place for the three R's, for knowledge and skill. Such knowledges and skills are important in the degree to which they increase the individual's potentialities for individual growth and social effectiveness. When the three R's are so viewed they are secondary rather than primary, means rather than ends. Since, however, they are important instrumentalities they are not overlooked.

The present tendency to view education as a social process is bringing more realism into school life. Pupils are studying their communities, participating here and now in the improvement of life both within the school and in the larger community. Since the life of the school is so important it is being subjected to careful scrutiny with regard to teacher-pupil relationships, and its fidelity to the American way of life. Similarly the community life comes in for careful analysis as it impinges upon educational problems and activities. Finally the administrative structure is being examined critically both as to its underlying philosophy and its practical operation in order that it may become an agency which furthers rather than hinders the educative process.

The present emphasis upon education as a social process holds the promise of giving us an elementary school with a balanced emphasis and marked effectiveness both for social and individual growth.

(E. O. M.)

Great Britain.—It is the non-spectacular and detailed work of the schools which constitute their most important contribution to national life. As the President of the Board of Education has stated: "There is no sphere of our national life in which greater changes have taken place during the last ten years than in education, and I can think of none other in which the actual change has been less realized by the average member of the public."

These changes comprise a wider choice of activities, more varied methods of teaching, a greater care of health and a better sense of community needs. And because of these things the cost of education rises though the number of school children diminishes. The average cost per head is now £16.17s.1d., an increase of 10s.

The campaign for improving national health continued during 1939. The estimates included £1,000,000 for free meals, an increase of £250,000; £1,000,000 was provided for the erection of 50 country camps, each to accommodate about 350 pupils; the National Fitness Council expended upwards of £1,500,000 on various schemes, and school buildings of lighter construction are now approved for loans for periods from 30 to 40 years, thus reducing annual redemption charges and avoiding the future burden of out-of-date buildings. One result of this health service was seen in the fact that of the militiamen called up for compulsory training only 2.6% were totally unfit, and 83% were completely fit. Yet deficiencies are still serious: inquiries into malnutrition show that 11% of school children are either "slightly sub-normal" or "bad," and a Ministry of Health Report on Health Services in Wales described some of the schools in terms as lurid as those used two or three generations ago. Seven hundred and ninety-seven ele-

mentary schools have still deficient premises.

The war brought speedy changes. The raising of the school-leaving age to 15, due three years after the Act of 1936, has been suspended, and thus a reform urged for over 20 years has perished at the moment of its realization. Over 1,000,000 school children were evacuated from vulnerable to safe areas with remarkable speed and efficiency, but at least 750,000 remained in the cities, where schools can only be re-opened when they have satisfactory air-raid shelters.

The situation, deplorable as it is for many children, has produced some interesting experiments. Home teaching of small groups by peripatetic teachers, the organization of independent study, and the improvisation of classes by the clergy and voluntary workers have met with a ready response. The claim is general that if there is less teaching there is more learning. And for children evacuated to the countryside there are the gains of a new environment and healthier conditions. In one instance boys showed an average increase in weight in one month of 2½lb. and girls of 3½ pounds.

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Education, Progressive. Progressive education has markedly influenced American educational theory and practice toward broadening the concept of the role of the school from one of primarily training children in the three R's to one of considering the whole development of the child as an individual and as a member of society. This concept lays increased emphasis on the fine arts and other forms of self-expression, on mental hygiene and family relationships, and on a study of our changing civilization and the part each member of a democratic society must play in guiding that change. While the spirit and ideas of progressive education have affected schools generally, the organized movement is represented by the Progressive Education Association.

This association, which is the United States section of the New Education Fellowship, had a membership in Aug. 1939, of 9,711. During the year 1939 it held a national conference in Detroit, attended by 4,500 persons, and 28 regional conferences in various parts of the United States and Canada, attended by 29,600 persons. The association has fostered scientific research and the preparation of curricular materials through its various national commissions and committees. The work of the Commission on Secondary School Curriculum, begun in 1932, reached completion in 1939. This commission has been responsible for the following publications: *Teaching Creative Writing* (Laurence H. Conrad); *Science in General Education*; *Reorganizing Secondary Education*; *Language in General Education*. Additional publications of the association were, during 1939, *Catalogue* and 26 *Study Guides for Films of the Commission on Human Relations*; and *Summer Workshops in Secondary Education* (W. Carson Ryan and Ralph Tyler).

The association last year assimilated, as a commission, the John Dewey Society, which publishes yearbooks on the relation of social change to education, and it also took over and reorganized the magazine, *Social Frontiers*, now called *Frontiers of Democracy*, and edited by William H. Kilpatrick, a monthly journal on social, economic, and political problems which bear upon education.

This journal supplements the official monthly magazine of the association, *Progressive Education* (edited by W. Carson Ryan) which deals with new movements in education, educational philosophy and classroom practice.

During 1939 the association sponsored ten "workshops" in educational institutions over the United States. These consisted

of six-week gatherings where specialists in child development, mental hygiene, curriculum, and evaluation, were available to the 1,000 teachers enrolled, to help them work out courses, methods, and materials. The Progressive Education Association in 1939 joined with the National Education Association in establishing a commission to study the ways in which schools can help to develop the human and material resources of their regions.

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Education, Secondary.

War and threat of war have had marked influence on secondary education in Europe and Asia in 1939 and have not been without effect in the Americas. In some areas there has been widespread dislocation of civilian pursuits as a result of hostilities, evacuation, or change of sovereignty. The result has been the interruption of some trends in secondary education and accentuation of others. A reviewer of a recent book on education in Czechoslovakia makes the comment: "It is to be feared that within a very few years much of the material in this book will seem like ancient history." Both France and England have projected notable reforms in secondary education, providing for a higher "leaving age," closer articulation with elementary and higher schools, some weakening of class distinction among types of secondary school, increased Federal support, and a more unified plan of teacher preparation. Some of the proposed reforms were initiated in France under laws passed in 1938. In Great Britain the report of the Consultative Committee on Education—the "Spens Report"—was presented to the Board of Education early in 1939. There seems little likelihood that its significant recommendations will receive serious attention before the close of hostilities. In neutral countries the economic dislocation attendant upon the war has already affected education budgets and has retarded or suspended planned reforms. The emphasis on national characteristics and development of attitudes appropriate to the support of national policies is unabated or has increased. This tendency is, naturally, more pronounced in the totalitarian states. "Totalitarian regimes . . . are out not only to control every manifestation of national life, but also to change man himself. . . . In all totalitarian countries education in the broadest sense of the word has become the chief tool for the accomplishment of these ends." Consideration of secondary education in these countries must include organizations not technically part of the school system—in Italy, the Balilla; in Germany, the Hitler Jugend and the Dienst-Arbeits; in Russia, the Young Pioneers.

In practically all countries there has been a growing recognition of the need for equivalent opportunity for youth in rural areas and for secondary education adapted to rural life. The excellent 1938 yearbook of the International Institute presents the developments in the various countries. Developments for the year in the United States, in the main, continued already discernible trends. Attacks on problems of curriculum by State and regional organizations continued, with selected secondary schools in California, Michigan, Ohio, and the Southern Association of Colleges and Secondary Schools given freedom and encouragement to experiment with revised curriculums.

Increased attention has been given to the use of radio and motion pictures in the school and to planned excursions. Closer co-operation of the school with its community has been stressed, both in interpretation of the educational program and in definite participation of the school in community improvement. There is a growing awareness of the responsibility of the secondary school toward all youth, illustrated in the effort to hold in school pupils who would ordinarily drop out, and in conscious co-operation with

other agencies ministering to the needs of youth—the NYA, the CCC, and the rapidly expanding adult education movement. A special phase of this responsibility has been recognized in the organization of guidance for pupils of secondary school age. A broadened concept of guidance involves conscious participation of a larger proportion of the teaching personnel.

The wave of economy in State and Federal expenditures has been particularly pronounced in its impact on school budgets and has prevented carrying out reforms the desirability of which has been generally recognized. Limitation by constitutional amendment of tax on real estate and failure to provide alternative sources of revenue have accentuated the problem in some States. This situation was dramatically signalized by closure of the schools of Toledo, Ohio, for two months near the close of 1939.

The year has seen publication of committee reports with significant implications for secondary education. The President's Advisory Committee on Education presents recommendations for legislation which would provide greatly increased Federal support of education with a view to reducing inequalities in educational opportunity, while leaving the determination of educational policies to the several States. The Regents' Inquiry into the Character and Cost of Public Education in the State of New York, published in eleven volumes, presented findings in various areas of the educational program. The volume dealing with secondary education raised serious doubts as to the efficiency of the traditional secondary school in achieving either vocational fitness or social competence. The Carnegie Foundation for the Advancement of Teaching published in 1938 a report on a ten-year study of secondary education in Pennsylvania. This served to point out the notable differences in individual ability of secondary school pupils and the wide disparity of achievement among the secondary schools of the State. Publications of the Educational Policies Commission focus attention on the principles basic to "education for American democracy," and the General Report of the Co-operative Study of Secondary School Standards, appearing in September, culminated seven years of study.

With the assumption of enlarged responsibilities and the dependence on outmoded forms of taxation, the problem of financing secondary education has assumed major importance. Through emergency grants, the Federal Government has contributed to costs of school building construction. It is generally recognized that further Federal aid and reorganization of State and local tax structures will be necessary to provide equal educational opportunities to children in rural districts, and to those of less prosperous States.

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Education, Vocational, has continued to expand in the United States during 1939, in enrolment of students as well as in extent and diversity of courses. Federal funds available under the George-Deen Act have continued to stimulate vocational education in agriculture, home economics, trades and industry, and distributive occupations. Some local budget retrenchments have temporarily curtailed certain aspects of the vocational school program, particularly evening classes, but in general there has been definite growth.

For many years the emphasis of industrial education has been on

the preparation of persons for the skilled trades. This emphasis is continuing, but it is worthy of note that more attention is being given to educational service for preparing the lesser intellectual youth for entrance into semi-skilled occupations, and the development of technical education programs of less than college level. National defence needs have received considerable attention during the year 1939. Definite shortages of skilled workers in the metal trades, and the rapid expansion of aircraft manufacturing, have been of concern to industrial educators. It is significant that at least one industrial school is operating an all-night shift in training workers for the machine industries. There appears to be considerable activity in the development of plant training programs for breaking in new workers.

Co-operative efforts by various governmental agencies concerned with the planning and carrying out of vocational education programs seem to have taken on increased significance during the past year. Conferences of representatives of the American Vocational Association and the National Youth Administration have worked toward mutual understanding of problems and joint planning of programs. Similar conferences were held by the representatives of the Agricultural Extension Service and the public educational authorities dealing with agriculture and home economics. These co-operative efforts seem to indicate a desire to avoid unnecessary duplication of service.

Vocational training for out-of-school unemployed youth has received considerable attention. Recent studies of the youth situation have revealed a problem of the first magnitude, and vocational educators have begun to realize the necessity for a large expansion of educational services for unemployed young persons. Co-operative efforts of the NYA and the public schools have been partially meeting this need, and the CCC has provided some training for its enrollees.

The induction of young persons into employment seems to be receiving more attention in the fields of industrial and agricultural education. School officials appear to be more concerned about vocational guidance needs, and to realize the necessity of carrying through with students until they are satisfactorily placed on jobs and are adjusted to work life.

Organized labour appears to be taking a more active interest in vocational education in the public schools, and labour relations are receiving more attention in industrial education programs. Interest in the development of apprentice training seems to be growing, although its growth has been retarded somewhat by certain provisions of the Federal Wages and Hours Act.

Continuing interest in the recent reports of the Regents' Inquiry in New York State and the President's Advisory Committee on Education is noted. Soon after the appearance of these studies, there was considerable criticism from vocational educators with respect to certain findings and recommendations. Careful study of these reports seems to indicate that unfortunate use of terminology had caused misunderstanding, and recently the criticism appears to be less caustic.

(L. A. E.)

British Isles.—The publication of the Spens Report heralded a wider conception of technical training as a factor in social progress. The main recommendation was that there be established in Great Britain new post-primary schools known as "Technical High Schools," similar to those established in New Zealand. The duties of these schools would be (1) to provide a good intellectual discipline apart from its technical value, and (2) to have a technical value in relation not to a single occupation, but to a group of occupations. The curriculum provides a liberal education "with science and its applications as the core and inspiration." The academic is no longer to be ranked as superior to the technical, nor intellectual growth to be nourished on dead subjects docketed and classified in text-books. In commercial education,

lacking the help of experts, the Spens committee failed to find a unifying principle.

The number of full-time students attending technical institutions in England and Wales in 1939 was 42,763, as compared with 40,016; and the number of part-time students 1,281,766—an increase of 137,386. Mr. Kenneth Lindsay, parliamentary secretary to the Board of Education, referred to these part-time students as "the cream of the whole educational system." He also stated that 16,000 boys were undergoing technical training in the armed forces. In Scotland, the enrolment of 161,938 students in continuation classes showed a substantial increase, and opportunities for advanced studies were greatly developed. In Eire a vocational commission was appointed to investigate the practicability of developing functional or vocational organizations.

British Dominions and Colonies Overseas.—Attempts were made everywhere to improve technical training and to avoid the error of placing "unhealthy and exaggerated emphasis" on the academic type of school.

(T. B.E.)

Educational Policies Commission: see EDUCATION.

Education Association, National: see NATIONAL EDUCATION ASSOCIATION.

Eggs. Prices of eggs in the United States advanced in early Sept. 1939 in line with the wartime rise of other commodities, but by the middle of the month price trends reversed and by late November egg futures on the Chicago Mercantile Exchange reached the lowest November price in six years. Increase in farm flocks during 1939 and heavier autumn and early winter egg production, because of mild weather, caused heavier receipts that brought prices down, and speculators who had stored eggs lost heavily. The number of laying birds in farm flocks Nov. 1, 1939 averaged 75.6, the largest for that date since 1930, comparing with an average of 72.5 in 1938 and a ten-year average of 73.8 layers per flock. The average number of pullets under laying age in farm flocks Nov. 1, 1939, was 34.6 compared with 33.8 a year earlier. Receipts of eggs in the four principal markets—New York, Chicago, Philadelphia, and Boston—from January 1 to September 30 in 1939 were reported by the Department of Agriculture as 11,880,961 cases compared to 10,918,408 cases in 1938 (30 dozen eggs to the case). Storage stocks Oct. 1, 1939, were 5,429,000 cases of shell eggs and 121,469,000lb. of frozen eggs, and 4,765,000 cases of shell eggs and 110,244,000lb. of frozen eggs on the same date in 1938. On Nov. 1, 1939, the Uner-Barry reports showed 3,528,000 cases of shell eggs in storage, as against 3,244,000 cases in 1938 and a five-year average (1934-38) of 4,292,000 cases. By November 25 storage holdings of shell eggs had declined to 1,929,000 cases, as against 1,853,000 cases on the same date in 1938 and a five-year average of 2,636,000 cases. Dealers who had stored eggs in the spring at 18½¢ a dozen, when the Federal Surplus Commodity Corporation was buying eggs for relief distribution, sold in late November at as low as 15½¢ a dozen, the Surplus Commodity Corporation having withdrawn its support in September. Exports of shell eggs from the United States the first nine months of 1939 were 1,887,380 dozen, compared to 1,603,938 dozen in the same period in 1938.

Exports of eggs from the United States during the World War (1914-18) were not of significant quantity and at the peak never

Imports of Eggs into the U. S., First Nine Months of 1938 and 1939

	1939	1938
Eggs in shell	224,042 doz.	162,411 doz.
Whole eggs, dried	49,500 lb.	137,115 lb.
Whole eggs, frozen	420 lb.	420 lb.
Yolks, dried	447,175 lb.	226,655 lb.
Yolks, frozen	25,330 lb.	430,220 lb.
Egg albumen, dried	387,283 lb.	467,831 lb.

represented more than 2.51% of the egg money received by farmers. (See also POULTRY.) (S. O. R.)

Egypt. Area c. 383,000 sq.mi. (arable land 13,600 sq.mi.); pop. (est. Dec. 31, 1937) 16,030,000. Chief towns (pop. 1937): Cairo (cap., 1,307,422); Alexandria (682,101); Tanta (94,421); Mansura (68,637); Damanhur (61,791); Asyut (59,925). Ruler, King Farouk I; premier, Aly Maher Pasha; language, Arabic; religion, Mohammedan 91%; Copt 7%.

History.—The Liberal-Saadist cabinet under Mohamed Mahmud Pasha, which held office throughout 1938, continued in 1939 until August 12 when Mohamed Mahmud Pasha resigned on grounds of ill-health. Aly Maher Pasha, political adviser to the King, formed the new cabinet on August 18. It was composed of nine Independents and five Saadists, a new portfolio being created for social affairs. The Liberals were dropped because they were dissatisfied with the portfolios offered them. The Saadist leader, Dr. Ahmed Maher Pasha, remained outside, and was eventually elected president of the chamber.

The War.—The outbreak of the war found Egypt well prepared. Ever since Munich the organization of the Egyptian Army had proceeded actively. A new Territorial army had been decreed. Viscount Gort had visited Egypt in February to confer with the Egyptian and British military chiefs. Joint Anglo-Egyptian manoeuvres had been held. An A.R.P. organization had been created in the principal towns. Indian troops had begun to arrive in August and soon after the commencement of hostilities further reinforcements reached Egypt, while British troops were withdrawn from Palestine to reinforce the western desert defences.

In lieu of declaring war Egypt severed her diplomatic relations with Germany in September. All steps necessary for dealing with the German community were taken. The British Government received all the assistance to which the Treaty of Alliance entitled it. A state of siege was declared with the premier as supreme governor.

Military courts and a censorship were instituted and a strict control of supplies and exchange was established. Parliament in special session approved of these measures on October 12.

In September public opinion became exercised over the disposal of the new cotton crop. Egypt could no longer export to Germany, Poland, Czechoslovakia and Austria, who normally took 25% of the total crop or some 1,700,000 cantars. After considerable discussion both in parliament and in the press and protracted negotiations between London and Cairo it was announced on November 17 that the British Government would purchase this quantity.

Other important events during the year were the departure of the heir presumptive, Prince Mohamed Ali, for the Mecca pilgrimage (February 7) the wedding of Princess Fawzieh,

the eldest sister of King Farouk, to the Shahpur of Iran (March 15); the discovery at Tanis, in the Delta of the tomb of one of the Sheshank kings of the 22nd dynasty, mentioned in the Bible; the visits of Dr. Goebbels (April 6) and Marshal Balbo (May 8), the approval by the National Bank of Egypt shareholders of the Egyptian Government's proposal to transform that institution into a Central Bank; the re-establishment of close relations between Turkey and Egypt by the dispatch in June of an Egyptian diplomatic mission under Abdel Fattah Yehia Pasha, minister for foreign affairs. (A. MN.)

Education, 1936-37.—Elementary and secondary: Government schools 4,795; scholars 930,248; high schools: Government 6; scholars 1,123; Fuad I university: scholars 8,150; foreign schools 410; scholars 76,750.

Banking and Finance.—Revenue (est. 1939-40) £E.40,247,000; expenditure (est. 1939-40) £E.41,847,000; public debt (May 1, 1938) £E.95,208,720; reserve from budget surpluses £E.33,062,569; notes in circulation (Aug. 31, 1939) £E.22,200,000; gold reserve £E.6,500,000; exchange rate (£E.1 = 100 piastres): 97½ piastres = £1 sterling.

Trade and Communications.—External trade (merchandise): imports (1938) £E.36,934,373; imports (Jan.-June 1939) £E.16,558,000; exports (1938) £E.29,342,486; exports (Jan.-June 1939) £E.16,470,000; re-exports (1938) £E.782,528. Communications and transport, 1938: roads, main 1,240mi.; secondary 3,430mi.; railways, State 3,537mi.; agricultural 876mi.; shipping 60,495 tons gross; entered ports 35,390,325 tons gross; passed through Suez canal 25,827,977 tons gross; motor vehicles licensed (Dec. 31, 1938): cars 29,382; commercial 4,074; cycles 2,051; wireless receiving set licences (Dec. 31, 1938) 78,823; telephone instruments in use (April 30, 1938) 59,922.

Aerial Navigation (1938)

	Misr Airways Company	Imperial Airways Ltd.	"K.L.M." Royal Dutch Air Lines
Passengers	18,559	6,056	2,459
Freight and baggage (Kg.)	63,828	114,189	45,140
Mails (Kg.)	16,435	1,482,130	131,851
Miles flown	1,011,104	6,967,935	2,795,180
Regularity of service	98.1%	99.9%	98.2%

Agriculture and Minerals.—Production 1938 (in metric tons): cotton, ginned 494,500; maize 1,570,700; wheat 1,250,200, (1939) 1,333,800; rice 725,200; petroleum 225,700; phosphate rock 458,400; cane sugar, refined 209,000; barley 232,700, (1939) 238,200; ground-nuts 15,600. (W. H. WN.)

Eire. Area 26,601 sq.mi.; pop. (est. June 30, 1939) 2,934,000. Chief towns (pop., census 1936): Dublin (capital, est. 1939; 482,300); Cork (80,765); Limerick (41,061); Dun Laoghaire (est. 1939; 40,600); Waterford (27,968). President: Dr. Douglas Hyde (*de h-Idé*); languages: Irish and English; religion: Christian (Roman Catholic 93%).

History.—Following on a pronouncement by the Catholic bishops of Ulster against the extension of conscription to the Six Counties, Eamon de Valera stated on May 2 that he had made strong representations to the British Government, which were effective. Later in the same month he protested against the conscription of citizens of Eire resident in Great Britain.

On the outbreak of war he declared his policy to be one of absolute neutrality, which the German Government, through its minister in Dublin, had promised to respect. A British representative—Sir John Maffey—was sent to Dublin to supplement the existing system of communications.

Following on the establishment of a ministry of supplies, a general cabinet reshuffle was announced on September 10. Mr. de Valera added education to his other departments; Mr. O'Kelly became minister for finance; Mr. Lemass, minister for supplies; Mr. McEntee took over industry and commerce; Mr. Rutledge,



QUEEN FARIDA of Egypt and her daughter, Princess Ferial

Industrial Production Census in Eire (preliminary figures) 1938

Industry or Trade	Gross output £	Net output £	Persons employed
Boots and shoes	1,743,206	825,984	6,508
Brewing	7,883,959	6,029,090	3,830
Sugar and confectionery	3,431,244	1,102,175	4,741
Bacon curing	6,052,123	850,350	2,381
Shirt making	417,207	185,138	2,097
Hosiery	1,101,211	559,445	4,887
Textiles	2,201,237	804,348	5,937
Tobacco	8,062,345	1,382,109	2,399
Vehicles	3,046,039	892,002	3,595

local government; Mr. Boland, justice; Mr. Traynor, defence; Mr. Little, posts and telegraphs; Mr. Derrig, lands; while Dr. Ryan remained in charge of agriculture and Mr. Aiken became minister for the co-ordination of defence.

An Emergency Powers Act (September 2) gave the Government extensive control over all economic activities, powers of arrest and internment, and power to impose censorship. The Army Reserve was mobilized, and a temporary black-out imposed.

On November 18 Mr. O'Kelly in an emergency budget, increased income tax by 1s. and imposed $\frac{3}{4}$ d. per pound on sugar, 2s.8d. per pound on tobacco, 12s. per barrel on beer, and 10s. per gallon on spirits, estimating for an increased revenue of £603,000, to be supplemented by a saving of £400,000 and a new loan of £7,000,000.

On April 1 a Treason Act became law, and on May 31 the Offences Against the State Act gave powers of arrest on suspicion. A proclamation of June 23 suppressing the I.R.A. was followed by numerous arrests and by a series of hunger-strikes. An application on behalf of a prisoner for a writ of habeas corpus was granted, by Justice Gavand Duffy, on December 2, in a judgment which declared the Offences Against the State Act unconstitutional. This led to the release of 58 prisoners, and an appeal to the Supreme Court, which was refused.

On December 23 the Magazine Fort in Phoenix Park, Dublin, was raided by an armed band who occupied it for 3½ hours and carried off 1,250,000 rounds of rifle and machine-gun ammunition. Intense police and military activity had resulted by January 1 in the recovery of about one-third of the amount carried off. Meanwhile the Dáil was specially summoned for January 3 to pass fresh emergency legislation. (M. T.)

Education.—In 1937-38: elementary schools, 5,166; scholars 469,925; secondary schools 336; scholars 36,092; universities: National 4,422 students; Trinity college, Dublin 1,489. (See also EDUCATION: *British Empire*.)

Banking and Finance.—Revenue, ordinary (1938-39) £31,884,000; (est. 1939-40) £32,522,000; expenditure, ordinary (1938-39) £33,110,000; (est. 1939-40) £35,716,000; public debt (March 31, 1939) £44,860,000; notes in circulation (Aug. 12, 1939) £16,058,921; gold bullion (March 31, 1939) £1,991,682; reserve, British bank securities (March 31, 1939) £8,173,000.

Trade and Communication.—Foreign trade (merchandise): imports (1938) £41,414,000; (Jan.-July, 1939) £24,978,000; exports (1938) £23,877,000; (Jan.-July, 1939) £13,242,000; re-exports (1938) £363,000. Communications: roads, main (1937-38) 10,000mi.; secondary 38,000mi.; railways, total track mileage (1938) 2,551mi.; shipping (1938): vessels 594; net tonnage 116,145; motor vehicles licensed (Aug. 1938); private cars 48,599; other vehicles 20,997; wireless receiving set licences (1937-38) 140,487; telephones, installations (1937-38) 26,190.

Agriculture, Manufactures, Mineral Production.—Production 1937, (in metric tons): oats 568,000; wheat 201,300; potatoes 2,500,200; barley 111,900; beet sugar 54,400; coal 120,000; wool 8,100. Agriculture and fisheries, net output (1937) £42,000,000; industry, net output (1937) £39,800,000. Labour 1937-38: number of insured workers, average 433,865; number of unemployed, average 88,714. (W. H. WN.)

Elections. The off-year elections of 1939, turning mainly on local issues, reflected no broad or deep change in the political situation as it was observed in 1938; and few dependable signs or portents appeared to indicate what is going to happen at the polls in 1940.

The Republicans showed unusual strength in the Chicago contest of April, when, although the Democratic incumbent Mayor Edward Joseph Kelly was again elected by a safe majority, the Republican candidate, Dwight Green, received the votes of 638,068 citizens—a larger percentage of the total vote cast than had been given to his party by the city in the presidential elections of 1932 and 1936.

In November the party also made visible headway in the East, extending particularly its legislative control in New Jersey and Pennsylvania; and in Cleveland it re-elected its candidate, Mayor Harold H. Burton, without serious opposition from the disorganized Democrats. But on the whole the balance between the major parties was not definitely shifted from where it stood at the end of 1938.

Within the Democratic fold the trend of developments was no more certain. In the April primaries of Mississippi (consummated by a run-off primary in August) Paul B. Johnson, with the backing of the strongly pro-Roosevelt Senator Bilbo, won the Democratic nomination for Governor over M. S. Conner, whose chief support came from the more conservative followers of Senator Harrison. With similar implication, in San Antonio's spring election, former Representative Maury Maverick, running on a progressive "Fusionist" platform, succeeded in capturing the mayoralty from the regular Democrat Charles Kennon Quin, who had helped to defeat his re-election to the House in the preceding year. Regulars and machine Democrats of New York county, on



THE MIDDLE OF THE ROAD is favoured by most 1940 presidential candidates, observes Ray in *The Kansas City Star*

the other hand, met only an apathetic resistance in November and were consequently able to carry their entire ticket; while in Memphis, Tenn., the redoubtable boss, Edward Crump, easily had himself chosen as mayor for the avowed purpose of resigning on Jan. 1, 1940, and securing the appointment of Representative W. Chandler to fill the office until the next regular election day.

In the August primaries of Kentucky Governor Albert Benjamin (Happy) Chandler scored a victory over Senator Alben Barkley by having his supporter, Lieutenant Governor Keen Johnson, nominated for Governor on the Democratic ticket. Johnson was subsequently elected without great difficulty over the Republican nominee Judge King Swope. But between these two events, on October 9, Chandler resigned from office, turning the governorship over to Johnson immediately; and in turn Johnson appointed him to complete the unexpired senatorial term of the late Marvel Mills Logan.

Radical successes were registered in a small way at Bridgeport, Conn. where the Socialist mayor Jasper McLevy was re-elected for the fourth consecutive time, and in Detroit where Edward Jeffries, actively supported by C.I.O., managed in a non-partisan contest to unseat Mayor Richard W. Reading, who had won the last election partly on the strength of his opposition to C.I.O. and to radicalism.

Of more general interest than these scattered local elections was the defeat in two areas of the movement for greater old age pensions. In California the proposed "Ham and Eggs" amendment, providing for payments of \$30 a week in scrip to the "senior unemployed," was strenuously opposed by Governor Olson and by Dr. Townsend, the well known exponent of generous pensions. The plan was defeated by a vote of approximately 2 to 1. In Ohio at the same time the less fanciful "Bigelow Plan" for pensions in regular currency of \$50 to single persons and \$80 to couples over 60 was rejected by a vote of more than 3 to 1.

Schedule of Elections.—Presidential elections in the United States are uniformly held on the Tuesday after the first Monday in November in years designated by multiples of four. Congressional elections are held on the same or corresponding day in even years by all States except Maine, which adheres to its old custom of holding elections on the second Monday in September. Governors are elected in even years on the same day as members of Congress in 22 States: Arizona, Arkansas, Colorado, Connecticut, Georgia, Idaho, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, New Mexico, North Dakota, Ohio, Rhode Island, South Dakota, Tennessee, Texas, Vermont and Wisconsin. They are elected quadrennially at the same time as the president in 10 States: Delaware, Florida, Illinois, Indiana, Missouri, Montana, North Carolina, Utah, Washington and West Virginia; quadrennially at the congressional elections between presidential years in 10 States: Alabama, California, Maryland, Nevada, New York, Oklahoma, Oregon, Pennsylvania, South Carolina and Wyoming; quadrennially on the corresponding day in the years immediately preceding presidential elections in 2 States: Kentucky and Mississippi; quadrennially on the corresponding day in the years immediately following presidential elections in 1 State: Virginia; triennially on the corresponding day (latest election Nov. 2, 1937) in 1 State: New Jersey. Louisiana chooses its governor quadrennially in presidential years on the third Thursday in April; and Maine, biennially at the same time as she selects her Congressmen. (See also DEMOCRATIC PARTY; REPUBLICAN PARTY.) For elections in other countries see under the name of the country. (G. P. BA.)

Electoral Vote. Following the census of 1910 the membership of the House was fixed at 435 and it has remained at that number since then, thus with the 96 sena-



"NOW THERE'S TWO OF 'EM," the riddle of the sphinxes, by Russell of *The Los Angeles Times*. Roosevelt did not clarify his presidential intentions in 1939, but Garner announced his candidacy December 16

tors, making the total 531. Under the reapportionment of 1932 the distribution of the electors among the States was changed because of changes in population. Eleven States gained one or more representatives in Congress and thus gained electoral votes, and 21 lost a representative thus losing an electoral vote. This apportionment became effective in the presidential election of 1932 and it will be effective in 1940.

Distribution of Electors among the States

Ala. . . 11	Ill. . . 29	Minn. . . 11	N.C. . . 13	Tenn. . . 11
Ariz. . . 3	Ind. . . 14	Miss. . . 9	N.D. . . 4	Texas . . 23
Ark. . . 9	Iowa . . 11	Mo. . . 15	Ohio . . 26	Utah . . 4
Cal. . . 22	Kan. . . 9	Mont. . . 4	Okl. . . 11	Vt. . . 3
Colo. . . 6	Ky. . . 11	Neb. . . 7	Ore. . . 5	Va. . . 11
Conn. . . 8	La. . . 10	Nev. . . 3	Pa. . . 30	Wash. . 8
Del. . . 3	Me. . . 5	N.H. . . 4	R.I. . . 4	W.Va. . 8
Fla. . . 7	Md. . . 8	N.J. . . 16	S.C. . . 8	Wis. . . 12
Ga. . . 12	Mass. . 17	N.M. . . 3	S.D. . . 4	Wyo. . . 3
Ida. . . 4	Mich. . 19	N.Y. . . 47		

(G. W. Do.)

Electrical Industries. Output of electricity took the sharp-est rise on record in 1939, just as in 1938 it took the sharpest dip. The two years together are an example of the economic buoyancy of the electric utility business. The 1939 output was 123,000,000,000 kw.hr., an increase of some 13% over 1938 and some 7% over 1937, the previous record year. In addition, 5,300,000,000 kw.hr. were purchased, some from Canada (a quarter), some from Government hydro plants, and some from inter-connected industry. During 1939 1,285,000kw. of new generating capacity was added, bringing the total up to 37,500,000 kilowatts. In ten years capacity has increased 26.8%, while output has gone up 36.4 per cent. The growth of load was so unusually swift during the last half of 1939 that commitments were made for new capacity in excess of anything in the last ten years. The 1940 program calls for 2,000,000kw. additional capacity and it is possible that 1941 steam capacity additions might hit a new all-time high.

Sales of electricity exceeded a hundred billion kilowatt hours in 1939 for the first time. Industrial usage due to the business up-

turn which was further stimulated by the European war was responsible for the greatest growth. Revenues increased 6% to \$2,304,000,000. Expenses were \$1,025,000,000, including the tax bill of \$345,000,000. Approximately 900,000 new customers were added during the year, bringing the total up to 28,750,000.

Although financing involved a total of \$992,000,000 in 1939, the new capital with the exception of the two bottom years of the depression was the lowest ever. It amounted to but \$16,000,000. The yield on utility bonds hit a new low, some issues going below 3% to maturity. Improved business was responsible for the largest construction budget in 1940 in the past ten years. It is \$605,000,000. Electrical manufacturers felt the good business conditions. Production was up 25% to \$2,143,000,000. This was still below 1937. By the end of 1939 REA had allotted \$267,000,000 to 687 systems. Of these 488 had been energized and had 400,000 consumers. Construction accounted for 180,000 mi. of lines, costs of which had been reduced to \$754 per mile.

Government hydro projects added 488,450 kw. in 1939, bringing the total in operation to 1,418,000 kw. out of an ultimate capacity of 6,762,000 kilowatts. Capacity to be added in 1940 will be approximately the same as for 1939. Because of the European war statistics on foreign operations have not been available.

Considerable spurt was given to higher-pressure, higher-temperature turbine and boiler installations during the year. Circuit breakers swung noticeably toward oilless designs. Industrial plants reflected a strong trend toward metal-clad switchgear. Late in 1939 a movement to standardize upon a universal interchangeable arrangement of distribution transformers as to tank, mounting, terminals, and bushings was nearing fruition. Use of capacitors was quickened both by the power industry and industrial plants to secure the ultimate capacity out of distribution facilities.

Reliance upon wood for impulse insulation gathered momentum as an adjunct to superior proofing of transmission lines against lightning, and with this went installation of expulsion tubes and gaps as well as extensive counterpoise installations. More intensive studies of grounding were also common.

High-voltage d.c. transmission received a boost from the late J. D. Ross of Bonneville as a means for bringing Columbia river power to the East. It was demonstrated, however, at A.I.E.E. meeting that d.c. is not a competitor of a.c. for long distances.

Two new radio channels were opened by FCC to utilities—2,292 and 4,637.5 kilocycles. Fluorescent lighting was pushed ahead by the New York and San Francisco fairs. More than 1,000,000 tubes had been produced by the end of the year, with 36-in. and 48-in. predominating. Two State commissions, Kentucky and Oklahoma, ruled against low power factor. The momentum of incandescent sales, however, continues. Nearly 1,000,000,000 were produced in 1939.

Some far-reaching legal decisions came down during the year, the most important being that of the 14 utilities *v.* TVA, in which it was held by the United States Supreme Court that utilities had no monopoly and that competition, whether by Government or private utility, was legal, that TVA operations were not illegal Government regulation and that sales of Government property in competition with others is not unconstitutional.

The same court in the Edison Light & Power case by upholding *Smyth v. Ames* declined to accept the prudent investment theory.

FPC was refused jurisdiction by the Appellate Court over hydro development that does not involve navigation.

The loss of taxes to State and local governments when public power succeeds private ownership stirred up action in several places. Alabama and Georgia produced bills restoring to their Government units all tax revenues lost when private power was taken over. Tennessee taxpayers started a campaign to secure from TVA enough to cover tax losses resulting from sale of pri-

vate utilities. The matter will be brought up in Congress in 1940.

Elections on municipal ownership were especially quiet in 1939. What few cases were up went almost all against public ownership. This situation reflects the stoppage of Government subsidies for this purpose.

Little came of the filing of integration intention in December, 1938. Reorganizations and widespread change in personnel resulted in little activity until late in 1939, when it was stated that the commission was ready to go ahead with enforcement of the law. The most startling action of the commission was to deny Consumers Power permission to sell new mortgage securities, but insisted that the money come from the sale of common stock.

The National Defense Power Committee was dissolved and the work taken over by the National Power Policy Committee. Its principal effort has been to secure acceptance of the grid plan for which the Government would appropriate several hundred million dollars.

There was little attack by the Administration during the year. The President declared that the Government would not extend its power development program, although negotiations have been under way with Canada over the St. Lawrence seaway.

The most important event of the year in the public power field was the settlement of the TVA controversy whereby Tennessee Electric Power and Memphis Power & Light sold out to TVA and cities in the system. In addition TVA purchased other properties in Tennessee and Mississippi. Government projects also purchased some private properties in Texas, Nebraska, and Oregon.

While the Government appears to be starting no new hydro projects, State authorities are springing up in Arkansas, New York, Illinois, and elsewhere. Outside of the purchase of the Tennessee properties TVA's achievement of the year was receiving a clean bill of health from the Congressional investigating committee. Greater evidence of desire of public power to dispose of its energy over private lines was shown in contracts in Georgia, Alabama, Texas, Nebraska, and Oregon.

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Electric Lighting. **Light Sources.**—Tungsten coiled filament lamps, with the majority of bulbs containing an inert atmosphere averaging 90% argon and 10% nitrogen gas, still constitute the chief illuminants throughout the world. Lamp consumption in the United States in 1939 was approximately 785,000,000 units of which 535,000,000 were large lamps, the remainder, miniature types. This total exceeds the previous year's use by some 10%. General quality improvements included the double coiling of filaments to reduce effective heat radiation surface; higher gas pressures, and a tendency toward smaller bulb sizes in North America, plus extending uses of krypton gas by European manufacturers. New filament types included the aluminized interior neck coatings on paraboloidal bulbs or reflector lamps in 150 and 300 watt sizes, together with coloured glass lenses that adapt these lamps chiefly for show window lighting. Side silvered tubular showcase lamps advanced in 25 and 40 watt sizes, and bowl-silvered indirect lighting lamps grew in popularity.

World-wide Electric Consumption*

Country	kw. per Person
U.S.S.R.	235
Italy	350
Japan	379
France	436
Great Britain	509
Germany	717
U.S.A.	1235
Sweden	1269
Switzerland	1643
Canada	2454
Norway	2760

*Includes about 40% for lighting.

A MIDGET MERCURY VAPOUR LAMP, developed in 1936-39 by Cornelis Bol of Stanford university, can clearly illumine an automobile at 500 feet. The lamp's diameter is only 2/25 of an inch

The average size of filament lamp sold in the United States was 62 watts, the average lumen output approximating 890. The assortment of six-hour-life photoflood lamps expanded for coloured motion pictures and several new wire photoflash lamps appeared with longer duration of flash, chiefly for press photography. For more powerful projection, especially of coloured light, there was introduced the 2,500 watt, 65 volt concentrated filament lamp.

Tungsten filament lamps designed to emit chiefly sub-visible infra-red radiation at 1,200 Angstroms were offered in 150 watt and 250 watt sizes in the reflector bulb, and up to 1,000 watts with the medium bipost base. Such lamps found increasing possibilities in connection with many drying operations of lacquers, paints, glued labels, and for spot heating. Heavy tungsten coils in heat resisting glass bulbs were developed in 1,000 and 2,000 watt sizes for the purpose of generating steam and vapourizing liquids. The "sealed beam" or large evacuated reflector lamp for automobile headlight service was standardized in the United States, giving the motorist better road lighting with reduced glare, and a device free from ordinary deterioration. Yellow headlamps were still favoured in Europe.

About 1,000,000 commercial fluorescent tubular lamps were sold, of which the rated life increased from 1,500 to 2,000 hours. Improvements in coatings increased the light output from 20% to 50% over the records of the introductory year of 1938. A bluer white colour was added to the former seven tints represented by an increase in the equivalent colour temperature from 2,800°K to 3,500°K; also a four-foot length of tube was added together with a six-inch, four watt, and a nine-inch six watt instrument type of flattened fluorescent lamp. The automatic glow relay control was developed to give instantaneous restarting of fluorescent lamps. True colour discrimination caused approximately half of the demand to be for the daylight white lamps. Some fluorescent lamp installations appeared in Western Europe and elsewhere, but high voltage mercury and neon filled tubing with fluorescent coatings still remained much in evidence in Western Europe. For decorative and special forms, chiefly electrical advertising, these latter illuminants were extensively employed in North American and some South American countries. Electric discharge or metallic vapour lamps continue to expand gradually, chiefly the 10,000 lumen sodium vapour lamp applied to areas of traffic concentration or dangerous roadways, docks and piers, while the high intensity quartz capillary mercury lamps extended for suburban street lighting were most popular in Western Europe.

Lighting Applications.—Black-outs or air raid precautions in European capitals led to street lighting recommendations on the order of 1% of moonlight (·0002 ft.-cs.) and gave incentive to the use of fluorescent paints and of screened mercury vapour lamps emitting practically no visible but considerable long-wave ultraviolet energies for excitation. The San Francisco Exposition demonstrated colour harmonies with fluorescent and mercury lamps, while the New York World's Fair incited interest in mercury and filament lighting of waterfalls and massive fountain sprays; the wide variety of usage of fluorescent lamps both high and low voltage; the application of translucent plastics in advertising signs, and black light in fluorescence. The 10th meeting of the International Commission on Illumination in Holland led to further inter-country lighting standardization, and recorded desirability of higher illumination intensities. (See also ELECTRICAL INDUSTRIES.) (S. G. H.)

Electric Power Generation. Electrical energy is obtained in the conventional manner from fuel and water power resources. Most of the available water power sites which are economically important from the standpoint of electric power production and disposition alone have been developed. The majority of the hydro-electric developments that are being undertaken at the present time are justified economically for the production of electrical energy only when considered in connection with irrigation, flood control, and navigation, or a combination of these factors. Undertakings of such broad scope are necessarily of a public nature and consequently have been carried on as complete or partial public or governmental enterprises.

The most recent hydro-electric projects of this type are Boulder and Parker dams on the Colorado river; Bonneville and Grand Coulee dams on the Columbia river; Norris, Guntersville, Pickwick, Chickamauga and Hiwassee dams on the Tennessee river and its tributaries; Shasta, Grand river, Santee Cooper, Fort Peck, Lower Colorado on other important rivers. Water wheel driven generators with a total aggregate capacity of approximately 2,500,000kw. are either in service or under construction for these projects. Additional projects are now under consideration.

Although the amount of electrical energy obtained from hydro-electric generating stations is relatively large, the greater portion is produced from steam driven prime-movers in fuel-fired generating stations. The steam turbine has completely supplanted the steam driven reciprocating engine as the prime-mover for driving electric generators. Most of the steam driven turbines in op-

eration at the present time have been designed to utilize steam at moderate temperatures and pressures. Large increases in the output and radical improvements in efficiency of steam turbines have been obtained by materially increasing the temperature and pressure of the inlet steam. Inlet steam pressures and temperatures of 1,200 lb. per sq. in. and 950° F. respectively are used quite generally for most of the steam turbines now going into service. A few projects are under construction using inlet pressures as high as 2,400 lb. per square inch. These increased pressure and temperature requirements have made it desirable and essential that highest possible rotational speeds be used to keep the weights and dimensions of the stator and rotor elements as small as possible.

The use of higher temperatures and pressures has greatly increased the range of capacities of the higher speed units into the field formerly held by 1,800 r.p.m. units or even of 1,200 r.p.m. units.

The two principal items of progress in turbine generators during the past few years are (a) the development of the 2-pole, 3,600 r.p.m. unit for ratings required by the Central Station industry, and (b) the application of hydrogen as the cooling medium.

A material increase in the output of the 2-pole generator has been obtained from the summation of several incremental increases resulting from improved mechanical, electrical, thermal, and magnetic properties of materials, more effective ventilation and improved design proportions and better utilization of materials. When using the best materials and design proportions available, it is possible to build the 2-pole, 60-cycle generators with air cooling for ratings up to 50,000 kilovolt-amperes. The most economical range of ratings for air cooled, 3,600 r.p.m., 60-cycle generators is from 500 to 25,000 kilovolt-amperes. During the years 1938-39, approximately 750,000 kva. capacity of 3,600 r.p.m. generators ranging in rating from 20,000 to 50,000 kva. have been placed in service.

The additional output rating of the 2-pole, 60-cycle generator was obtained by using hydrogen as the cooling medium. As compared to air, hydrogen has a density of 7%, heat transfer coefficient of 135%, thermal conductivity of 700%, and specific heat of approximately 100%. With these properties, the use of hydrogen as the cooling gas makes it possible to obtain an increase in rating of approximately 15% over that obtainable with air cooling, on the basis of maintaining given rating and performance characteristics. Since the windage-friction and ventilation losses are directly proportional to the density of the cooling gas, they are practically eliminated when hydrogen is used as the coolant. The increase in efficiency is on the order of 0.6 to 0.9%, depending on the rating. A similar increase in rating and improvement in efficiency performance without any explosion hazard can be obtained by using helium as the cooling gas. At the present time, however, the use of helium gas for this application is less desirable on account of its higher cost.

The advantages of hydrogen as a cooling medium for turbine generators are:

- (1) Reduced windage, friction, and ventilating losses, because of the low density of the hydrogen gas. The ventilating losses are proportional to the gas density. Full load efficiency of the generator may be 0.6% or more higher than for the corresponding air cooled machine.
- (2) Increased output per unit volume of active material, because of the high heat storage capacity, thermal conductivity and heat transfer coefficients of hydrogen. This advantage of hydrogen cooling makes it possible to build turbine generators for higher ratings than are possible with air cooling.
- (3) Reduced maintenance expense, because of the freedom from dirt and moisture.
- (4) Increased life of the insulation on the stator winding, because of the absence of oxygen and moisture in the presence of corona.
- (5) Reduced windage noise, because of the low density of the gas.

LIGHTNING which strikes transmission lines is by-passed to the ground by de-ion gaps on a self-protected transformer, demonstrated in 1939 with artificial bolts

Approximately 2,250,000 kva. of hydrogen cooled turbine generators were either in service or in manufacture in 1939.

The fuel oil type of internal combustion engine has been developed rapidly during the past few years and is now a reliable and economical prime-mover for slower speed generators of ratings up to 2,000 kva. capacity. The applications of generating units of this type are for auxiliary power on ships, small generating stations and mobile power plants. (See also WATER POWER.)

(C. M. LA.)

Electric Transmission and Distribution.

In the Pacific Northwest section of the United States a power development of tremendous proportions was under way in 1939. Construction is in progress on high-tension transmission lines of various lengths tying together the Bonneville and the Grand Coulee power stations and the several substations of the system. Studies and plans are being made with the expectation that these Government projects will be interconnected with the private and municipal enterprises of the region to form a high-voltage network or grid. The engineering studies associated with this project are so extensive that a network analyzer (miniature power system) was purchased in 1939 to aid in the solution of the network problems which will be constantly



arising. It appears possible that the first long direct-current transmission line in the U.S.A. may be built as a part of this system.

A new single-circuit line to operate in conjunction with the original 266-mi. double-circuit Boulder Dam Line was under construction and is scheduled to be put into operation early in 1940. Every available technical consideration has been incorporated in the design and operation of these lines and their associated stations to give them a high degree of reliability because they form a major source for the system into which they deliver power. Another single-circuit line, 233mi. in length and operating at 220 kilovolts, was put into service in July 1939. This line runs from Boulder dam to Chino, Calif., substation of the Southern California Edison Company, and is to be extended 27mi. to Barre substation, now under construction near Stanton. In contrast with the other lines, this newest line is of less expensive construction and, although provided with ground-fault neutralizers (Petersen coils) to suppress line-to-ground faults, can be put out of service temporarily by line-to-line faults. These interruptions can be tolerated in this case because of the adequacy of the other base stations of the Southern California Edison system.

In the U.S.S.R. the carefully planned program of power development and utilization has materialized phenomenally during the past ten years. High-voltage transmission is standardized at 110 and 220 kilovolts and the new equipment is getting to be more largely of Soviet manufacture. A very high proportion of the power transmitted is used in industry and an increasing proportion in agriculture. The general plan has been the development of centres of power production, and the more recent development of the plan has been the integration of these centres into an interconnected unitary system.

The 220-kilovolt cable line in Paris, the 132-kilovolt lines in New York and Chicago, and the 125-kilovolt line in Germany have continued their satisfactory operation and four 150-kilovolt monophasic cables (one standby) have been installed between Rotterdam and The Hague.

Notable advances have recently been made in reducing the cost of the production and distribution of electric power. These economies begin at the power house where topping, or superimposed, turbines utilizing steam at high pressures have made possible the production of 25% to 50% more power with the same fuel consumption. The newer and more efficient stations and their associated transmission facilities are operated at high load factors and close to unity power factor, with the less efficient stations taking up the peak increments and the reactive power.

In distribution systems, economies have been effected in several ways. Perhaps the most noteworthy of these is the almost universal application in Great Britain of the tap-changing transformer to increase the utility of existing branches of the secondary and distribution grids. Practically all of the large transformers have been fitted with tap-changing gear. The extension of this idea to smaller distribution transformers is now taking place rapidly. In these cases, a simple design of tap-changing gear with mercury switches is placed on the tops of the existing transformer tanks. New designs of induction regulators with increased voltage ranges and kilovolt-ampere ratings have been developed in Germany and are being applied in several countries for purposes similar to that of the tap-changing transformer. Similar economies are seen in the United States in the application of tap-changing transformers and induction regulators and also of phase-shifting transformers. Better power factors in both high- and low-tension lines have resulted from the further application of shunt static capacitors, thus reducing the power losses. (See also RURAL ELECTRIFICATION.)

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Electric Transportation. While electric transportation is frequently considered as embracing only electric railways, the fact is that it includes also some thousands of electrically operated highway vehicles such as trackless trolleys, gas-electric and diesel-electric buses. All types of electric transportation have certain points in common, but their most recent developments have followed such divergent lines that they can best be classified under five separate headings: (1) electric surface railways, (2) electrically operated subways and elevated railway lines, (3) electric trackless trolleys or trolley buses, (4) electrified trunk-line railroads and (5) buses and trains operated electrically from self-contained generating units. All of the first four classifications receive their power from more or less remote electric generating stations of sizable capacity, while the last mentioned have their own power plants on the individual vehicles, using gasoline engines or diesel engines to drive electric generators which supply energy to the traction motors. The electric surface railways, the electrically operated subways and elevated railways, the electric trackless trolleys, and the electrically driven buses are operated, in the main, in urban transportation service. The electrified trunk-line railroads and the trains with self-contained electric generating units are operated, in the main, in long distance transportation service.

Electric Surface Railways.—For many years the electric street and interurban railways were virtually the only means of public passenger transportation in urban communities and adjacent areas. At the present time, however, that is not true. On the one hand the development of rapid transit subways and elevated railways has absorbed a part of the traffic formerly carried by the surface railways in the larger cities. On the other hand the development of automotive vehicles, both private and common-carrier, has absorbed another part of the traffic formerly handled by electric railways. To measure the exact effect of these several influences is extremely difficult. In the United States the total number of passengers carried by all forms of local transit service in 1939 was substantially greater than the number carried before the

Cities With New Streamlined Street Cars
(As of Jan. 1, 1940)

In the United States		Number of Streamlined Cars
Atlantic City, N. J.		1
Baltimore, Md.		68
Boston, Mass.		1
Chicago, Ill.		83
Cincinnati, O.		3
Los Angeles, Calif.		95
New York, N. Y. (Brooklyn)		100
Philadelphia, Pa.		23
Pittsburgh, Pa.		301
St. Louis, Mo.		100
San Diego, Calif.		28
San Francisco, Calif.		5
Washington, D. C.		187

In Canada		
Toronto		140
Vancouver		1
Total		1136

Cities With New Streamlined Rapid Transit Cars		
New York, N. Y. (Brooklyn)		3
Oakland, Calif.		176
Philadelphia, Pa.		76
Total		255

advent of the automobile and was approximately 80% of that carried in 1929. In view of the fact that general business and industrial activity in 1939 was also about 20% lower than it was in 1929, the inference is that general business conditions have been the major factor influencing transit riding. In other words, the increase in the use of private automobiles has not greatly diminished the need for public transportation service.

The manner in which this service is rendered, however, has undergone far-reaching changes. Whereas the electric surface railways once enjoyed a virtual monopoly of public passenger transportation in urban areas, they now handle only about 50% of such riding. Subways and elevated railways carry about 20%, trackless trolleys about 5% and motor buses about 25%. In this connection it is interesting to note that an appreciable proportion of the buses are equipped with electric drive, so that it is not unlikely that as many as 80% of all transit passengers are carried on electric transportation vehicles.

While the relative importance of the surface electric railway has undoubtedly diminished, this form of transit service remains the largest single element in local transportation service. Recent years, indeed, have witnessed an energetic endeavour to modernize and improve electric surface railways. The United States and Canada have taken the lead in this activity. Since 1937 more than 1,100 modern, streamlined street cars have been purchased by transit companies in 13 cities in the United States and two in Canada. The great majority of these new cars are of the so-called "Electric Railway Presidents' Conference Committee" design, brought out in 1936 as the result of an extensive program of research to develop a new type of light-weight, fast, silent street car. Rubber springing and improved control and braking equipment are features of the design.

At the same time that modernization of street railway equipment has been going forward in U.S. and Canadian cities there has been similar activity in numerous cities in other countries. For example, the transit companies in Genoa, Milan, Oslo, Moscow, Brisbane and Buenos Aires have all installed new types of fast, streamlined cars with unusually attractive passenger accommodations.

Elsewhere the developments with respect to electric surface railways have shown mixed trends. Paris has replaced its entire street railway system with motor buses. London and Manchester have plans for eliminating all street cars and using a combination of motor buses and trolley buses. On the other hand, Glasgow and Liverpool continue to rely mainly on electric railways. In some cities where substitutions have been planned, their execution

Rapid Transit Systems of the World
(As of Jan. 1, 1940)

Place	Miles of Track	Cars	Place	Miles of Track	Cars
Barcelona*	37	92	Madrid . . .	12	144
Berlin . . .	276	2,372	Moscow . . .	33	128
Boston . . .	55	528	Munich . . .	Under construction	
Buenos Aires*	22½	204	New York†	1,006	8,408
Chicago . . .	202½	1,640	Osaka . . .	1½	No data
Cleveland . .	29	34	Paris . . .	110	2,781
Elberfeld . .	8	67	Philadelphia .	73½	540
Glasgow . . .	13	50	Prague . . .	Under construction	
Hamburg . . .	50	328	Sydney . . .	2½	No data
Liverpool . .	13½	57	Tokyo . . .	10	20
London . . .	492	3,629	Vienna . . .	87	483

*Total for three systems.

†Total for five systems.

has been held up since the outbreak of the European War, partly because of the difficulty of obtaining fuel for motor buses and partly because of the difficulty in securing new vehicles of any kind from the manufacturers. Some transit systems are reported to have withdrawn bus service and restored street railway service on certain routes because of the fuel problem.

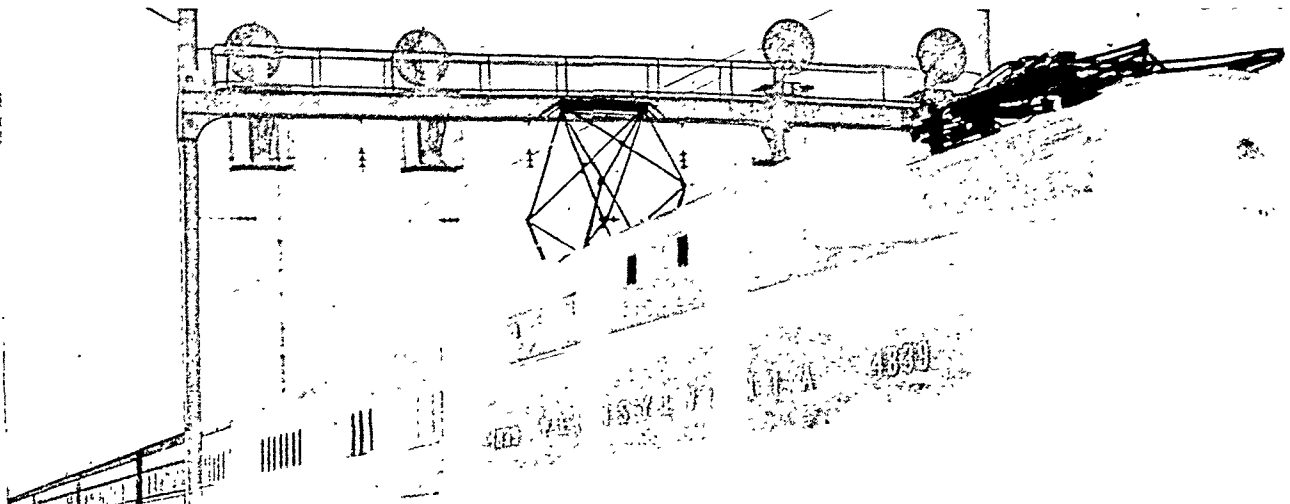
Rapid Transit.—Growth of rapid transit facilities, subways and elevated railways, has progressed slowly but steadily during recent years in a number of large cities throughout the world. Even greater progress would undoubtedly have been made if the cost of providing such facilities had not been extremely high. This had tended to confine the construction of both subways and elevated railways to territory where the traffic is unusually dense. In 1939 there were only 12 cities in the world having extensive underground rapid transit facilities. These were Barcelona, Berlin, Boston, Buenos Aires, Glasgow, London, Madrid, Moscow, New York, Paris, Philadelphia and Tokyo. Construction was under way, however, on a subway project in Chicago.

Extensive elevated railway systems exist in Chicago, Hamburg, Liverpool, New York and Philadelphia. Besides these there are services which are essentially of a rapid transit character in a number of other places, including Cleveland, Vienna, Warsaw, and the San Francisco bay region.

The last mentioned, which commenced operation in Jan. 1939, connects the City of San Francisco with Oakland and nearby cities via the 8¼-mi. San Francisco-Oakland bay bridge and saves commuters 20 to 30 min. per trip in comparison to the time formerly required to cross the bay by ferry.

From the standpoint of size the subway under construction in Chicago is by far the most important new development in the rapid transit field. When completed it will provide 7.7 mi. of double, parallel tunnels through the heart of the downtown district of the city, connecting with existing elevated railway lines at out-

A STREAMLINED ELECTRIC LOCOMOTIVE pulls the "Trail Blazer," all-coach train put in service in 1939, for part of its run between New York city and Chicago



lying points. The estimated total cost of constructing this subway, without equipment, is \$46,000,000, of which \$28,000,000 is to be paid by the city of Chicago and \$18,000,000 through a grant from the United States Government. Had it not been for this grant the probability is that the project would not have been undertaken when it was. New York, Philadelphia, London, Paris and Buenos Aires have all extended their underground systems recently but none of these extensions has as much significance to local transportation in the territory served as the new subway will have to Chicago.

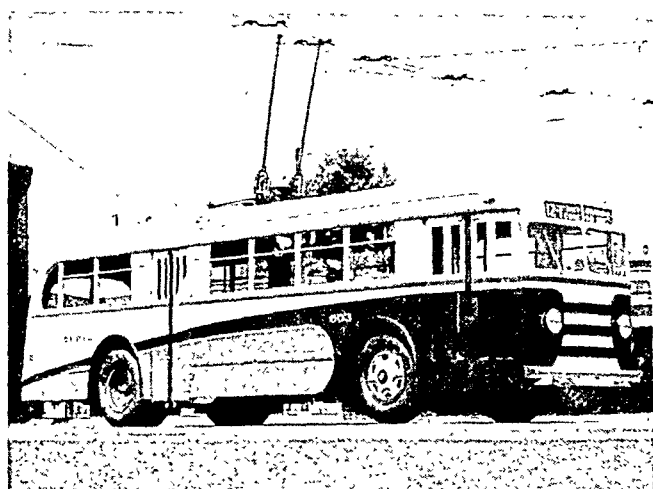
Most outstanding of the recent events in the field of rapid transit equipment has been the placing in service of a new type, streamlined, three-body articulated car by the New York Rapid Transit Corporation in the early part of 1939. This vehicle incorporates the latest types of aviation structural design in the use and assembly of aluminium alloys and the most recent developments in springing and mounting contributed by the rubber industry. In its design air conditioning is used for the first time in rapid transit equipment.

Trackless Trolleys.—Although it is a relative newcomer in the field of electric transportation, the trackless trolley, or trolley bus, has made astonishing progress in recent years. According to the latest available figures there were more than 6,000 of these vehicles in use in 1939 in a score of countries throughout the world. Great Britain and the United States were the leaders in this field, the former having some 2,600 such vehicles in operation and the latter approximately 2,400. Elsewhere there were about 1,300 additional trolley buses in operation, the largest system being that of Moscow, which was reported to have more than 500 vehicles.

Establishment of extensive trolley bus operations in Great Britain antedated that in the United States by a few years, starting in the reconstruction period following the World War (1914-18), when there was great need for improvement in transit facilities. At that time trolley buses were substituted in place of worn out tracks and tram cars in a number of British cities. This trend has continued steadily until the trolley bus has become one of the most important elements in local transportation in Britain.

Trolley bus growth in the United States may be said to have commenced in 1928 with the establishment of a sizable system at Salt Lake City. Prior to that there had been a number of small installations elsewhere but none of them was particularly successful. The improved vehicles operated at Salt Lake City, however, demonstrated the possibilities of this new form of transportation and its expansion has been continuous since that time. In 1939 there were 64 cities in the United States having trolley bus service and two in Canada.

The greatest use was made of this type of vehicle in the cities of medium size. A total of 30 U.S. cities between 100,000 and 500,000 population were in 1939 served in whole or in part by



LATE MODEL "TRACKLESS TROLLEY," placed in operation in Sept. 1939 at Wilmington, Delaware

trolley buses. In cities under 100,000 population there were 26 installations and in those over 500,000 population there were eight. Among the cities which decided to enter the field of trolley bus operation during the year 1939 were Denver, Ft. Wayne, Wilmington and Seattle. In the last mentioned city it was planned to abandon street railway operation entirely and install more than 100 mi. of trolley bus route with 235 vehicles, using also a considerable number of motor buses on feeder routes.

Electrified Trunk-Line Railroads.—New developments in the field of electrified trunk-line railroad operation have been relatively few in recent years. While there are more than 6,000 mi. of electrified trunk-line track in operation in the United States there have been no important extensions since the Pennsylvania railroad completed the electrification of its main line between New York and Harrisburg. This lack of activity has been due to the high cost of constructing facilities for electric operation and to the popularity of the new trains operated by diesel-electric power (see below). In Europe there has been somewhat more interest in railroad electrification due to the availability of hydro-electric power and the desire to cut down the use of fuels which have to be imported. Even there, however, the use of diesel power has tended to retard expansion of railroad electrification.

Self-contained Electric Units.—Vehicles operated by electric power generated within the vehicle itself have been increasing in popularity in recent years. The first step in this direction was the development of the gas-electric bus about 1930, designed to eliminate the frequent gear shifting required in the operation of mechanically driven buses. While the early gas-electric buses were successful in accomplishing this purpose they had some serious disadvantages due to the fact that the generator output was not sufficient at the most economical speed of the gasoline engine. With the development of the diesel engine, however, it became possible to accomplish the desired result more satisfactorily and the use of diesel-electric buses has been growing rapidly. In 1939 there were about 1,700 gas-electric buses in operation in the United States and Canada and another 300 diesel-electric buses.

The same principle is also widely employed on trunk-line steam railroads. Many switching engines have been built with the diesel engines driving generators, the power of which is then transmitted to electric motors to propel the vehicle. More recently the same type of power has also been used to haul many high-speed passenger trains such as the "Zephyrs" operated by the Burlington, the "Rockets" of the Rock Island, the "Super Chief" of the Santa Fe, the "Streamliners" of the Union Pacific and the "Capital Limited" of the Baltimore & Ohio. A recent innovation in

Growth of Trolley Bus Operation in U.S. and Canada

Year As of Jan. 1	Number of Vehicles	Miles of Route	Cities Served
1928	29	31	3
1929	41	38	4
1930	62	61	5
1931	174	142	9
1932	258	187	18
1933	285	276	18
1934	395	378	20
1935	448	467	23
1936	648	592	25
1937	1161	855	48
1938	1699	1203	59
1939	2051	1503	63
1940	2255	1730	66

vehicles with self-contained generating plants was a steam-electric locomotive put in service in 1939 by the Union Pacific. In this design an oil-fired, steam boiler drives a turbo-generator which furnishes electric power for the traction motors. (J. A. M.)

Electrification, Rural: see RURAL ELECTRIFICATION.

Electron: see MATTER, STRUCTURE OF; PHYSICS.

Elementary Education: see EDUCATION, ELEMENTARY.

Ellis, (Henry) Havelock (1859–1939), British psychologist and author, was born on February 2 at Croydon, Surrey. Descended from sea-faring families, he spent much of his youth on the Pacific and for four years (1875–79) he taught school in various parts of New South Wales, Australia. Here, as a lad of 19, he determined that his lifework should be the study of sex. He returned to England, studied medicine at St. Thomas's hospital and after a short time in private practice became completely absorbed in literary and psychological work. He began his monumental *Studies in the Psychology of Sex*, but the book was without honour in his own country and was published only in Germany and the United States (for a partial list of his works see *Encyclopædia Britannica*, vol. 8, p. 374). Recognition of Ellis's work was belated, but scientists and laymen alike ultimately conceded that he had established a true scientific approach to a subject whose mere mention was often taboo in the early 20th century. In his later years Ellis led a secluded life in a poor quarter of London. He continued writing in his advanced age and published *George Chapman* (1934), *My Confessional* (1934), *Questions of Our Day* (1936), and *Sex in Relation to Society* (1937). His life story, *My Life*, appeared in 1939. He died at Hendlesham, near Ipswich, on July 8.

El Salvador: see SALVADOR, EL.

Embassies, Great Britain: see AMBASSADORS AND ENVOYS: *To and from Great Britain.*

Embassies, United States: see AMBASSADORS AND ENVOYS: *To and from the United States.*

Emery. Properly speaking, emery is a mixture of corundum and magnetite, though in some of the inferior grades much of the corundum is replaced by spinel and other minerals. Although a heavy producer of emery during the World War, the United States now has no output, and imports the entire requirement, which dropped to 426 long tons in 1938. The best emery comes from Greece and Turkey, each of which exports about 15,000 tons annually. The Greek (Naxos) emery is considered best for grinding wheels, while Turkish is used for general polishing work and emery cloth. Grecian emery goes mainly to Germany and Netherlands, and Turkish to England. (G. A. Ro.)

Emigration: see REFUGEES.

Enderbury Island: see SOUTH SEA AND EQUATORIAL ISLANDS.

Endocrinology. The year 1939 has been marked by further advances in the knowledge of the inter-relationship between the endocrine glands and the central nervous system. The nervous pathways which link the hypothalamus to the hypophysis through the pituitary stalk, have long been recognized anatomically. Within recent years Fisher, Ingram and Ranson have investigated the functional activity of these nervous connections and have shown that they are chiefly concerned with certain actions of the posterior lobe of the gland. Discrete destruction of the hypothalamic nuclei from which the fibres originate, leads to atrophy of the posterior pituitary accompanied by permanent diabetes insipidus. The same procedure in pregnant

animals causes protracted and difficult labour at parturition. The very recent work of Ingram has indicated a possible mechanism by which the posterior pituitary gland is influenced in its regulation of water metabolism. He found that the urine of experimentally dehydrated animals contained an antidiuretic substance similar in its action to extracts of the posterior hypophysis. Section of the pituitary stalk prevented the appearance of this substance.

The few and poorly defined nervous pathways to the anterior lobe of the hypophysis, have been described by Rasmussen. However, there is now some evidence for the functional importance of these nervous connections. It is possible that the gonadotropic hormone of the anterior hypophysis may, under certain circumstances, be released as a result of a reflex nervous mechanism. Thus, section of the pituitary stalk has been shown to prevent the ovulation which normally follows coitus or mechanical stimulation of the cervix in rabbits. Similarly the hyperplasia of the thyroid gland which follows exposure to cold, and which is presumably due to secretion of thyrotropic hormone, is absent in animals in which the pituitary stalk has previously been sectioned. However, the mediation of the central nervous system in the activity of the anterior hypophysis is apparently confined to those reactions which are initiated by stimulation of nervous receptors. The maintenance of functions such as growth and the trophic influences of the anterior pituitary on other endocrine glands, are not affected by sectioning the nervous connections in the pituitary stalk (*cf.* Evans-Uotila).

The importance of the hypothalamus in relation to phenomena which were formerly considered to depend primarily upon the endocrine activity of the anterior lobe of the pituitary gland, is also illustrated by the observations of Hetherington and Ranson upon experimental obesity.

They observed the incidental occurrence of marked obesity in cats, guinea-pigs, and a monkey, following experimental injuries to the hypothalamus in the course of studies on diabetes insipidus. More recently they have been able to produce marked obesity in rats at will, by punctate injury to the supra-optic nuclei of the hypothalamus.

Anterior Pituitary Gland.—Previous work has indicated that the various hormones of the anterior hypophysis resemble proteins in their chemical composition. A beginning has now been made towards the knowledge of their actual structure. Fraenkel-Courant and Evans have shown that incubation with cysteine potentiates the effect of the growth hormone, and inactivates preparations of gonadotropic hormone.

It therefore seems likely that the activity of these hormones is associated with —SH and —SS groupings in their molecules. This makes them comparable to the growing list of active proteins, including insulin and various tissue enzymes, which also depend upon these same groupings for their activity.

The diabetogenic and anti-insulin effects of extracts of the anterior lobe of the hypophysis have been explained in one of two ways: (1) An inhibition of the utilization of carbohydrate, or (2) an increased formation of sugar from non-carbohydrate sources. The recent work of Soskin, Levine *et al.* has substantiated the latter view. They have also found that the thyroid gland plays a significant role in the metabolic disturbance which follows hypophysectomy. The decreased formation of blood sugar which accounts for the hypoglycemia of fasting in these animals, is partly due to the secondary atrophy of the thyroid. This leads to a diminution in the rate of endogenous protein catabolism to amino-acids, thus limiting the available raw material for sugar formation. The difficulty can be obviated by the administration of thyroxine.

Thyroid.—It has been known for some time that all the activity of thyroid extract cannot be accounted for by the amount of

thyroxine which it contains. It has been found to be more accurate to assay the potency of thyroid extract on the simple basis of total iodine content. The work of Salter, Lerman and Harington indicated that the active portion of thyroid extract consisted of thyroglobulin associated with diiodotyrosine and thyroxine. Very recently, these same authors have shown that simple iodination of a serum proteins results in the formation of a complex having thyroid activity. This may mean that thyroid activity is not exclusively confined to one specific iodine compound. However, it is possible that the activity obtained in the above manner may have been due to the *in vitro* formation of thyroxine. Ludwig and Mutzenbecher (confirmed by Harington) have demonstrated the formation of thyroxine crystals by incubating casein with a compound solution of iodine.

Adrenal Cortex.—It has been generally supposed that the disturbance in sodium and potassium metabolism which follows adrenalectomy, is due to a change in the permeability of all tissue cells to these ions. This view has been modified by the recent work of Darrow, who showed that the primary effect of lack of adrenal cortical hormone is on the kidney tubules. This leads to an abnormal excretion of sodium and a retention of potassium, which in turn alters the mineral balance of the body as a whole. It is also becoming more apparent that the disturbed mineral equilibrium does not account for a large proportion of the abnormal phenomena associated with the metabolism of the foodstuffs. Nor is there any direct relationship between the degree of mineral imbalance and the symptomatology of Addison's disease.

Desoxycorticosterone, first synthesized and later isolated from adrenal cortical extracts by Reichstein, has been submitted to considerable clinical trial during 1939. It has been found to be quite potent in the correction of the mineral disturbance of Addison's disease and in the alleviation of some of the symptoms. At the present time, however, it seems likely that it will not be able to substitute completely for the adrenal cortex.

Ovary.—As regards the oestrogenic hormones, the initial exploratory work concerning the chemical structure of the naturally occurring substances has begun to give place to studies of their metabolism after they are secreted into the bloodstream. It appears that the body disposes of these hormones not only by excretion into the urine, but also by destruction in the liver. A striking illustration of the potential importance of the liver in the sex cycle may be found in the work of Talbot. He showed that the production of a functional deficiency of the liver by carbon tetrachloride poisoning in immature rats precipitated a persistent oestrus, presumably by permitting an accumulation of the sub-threshold amounts being secreted by the immature ovaries. In addition to excretion and destruction of the oestrogenic substances, it has also been demonstrated that the more potent forms of the hormone may be transformed to weak oestrogens in the body. Pincus found that oestrone is converted to oestriol by the non-involuted uterus of the rabbit. The presence of progesterone from the corpus luteum catalyzes this reaction. He has suggested that these processes may play an important role in the normal sex cycle and in parturition. It may be supposed that when the corpus luteum is functioning, the rapid conversion of oestrone to oestriol does not allow the building up of sufficient oestrogenic activity in the blood to stimulate the uterine musculature. But as the corpus luteum regresses, the sudden diminution in oestrone to oestriol transformation may raise the level of oestrogenic activity in the blood to a point at which uterine contraction is initiated.

The preparation of synthetic oestrogens continues. Dodds and co-workers have recently announced the synthesis of hexoestriol, a compound even more potent than the stilboestrols reported in 1938. As regards the latter, they have been subjected to con-

siderable experimental clinical trial during the year 1939. They have been found to be very effective in reproducing all the physiological and therapeutic effects of the naturally occurring hormones. However, the question of toxicity has arisen and is not yet settled. At the present time extreme caution must be exercised in the use of these and other synthetic products, for purposes other than experimental clinical trials.

Testis.—Within recent years the study of the chemical structure of the sex hormones has shown them to be closely related to the carcinogenic steroids. The relationship between the oestrogens and neoplastic growth has long been recognized clinically. The removal of the ovaries following excision of a carcinoma was found to minimize the possibility of metastasis or recurrence. Lacasagne has, more recently, demonstrated that the administration of large amounts of oestrogenic substance to susceptible strains of mice, significantly increased the incidence of breast carcinoma in the females. The males of the same strain, which ordinarily were free from cancers of the breast, did develop such neoplasms after treatment with the oestrogens. Murlin, *et al.*, have now reported work which attempts to discover the reason for the relative immunity of the male animals to tumour growth. They found that the administration of crude extracts of urine containing the various androgens and the injection of testosterone propionate into male rabbits implanted with Brown-Pearce carcinoma, significantly inhibited the growth and metastatic spread of the implants. Testosterone, androsterone and oestrone gave no evidence of any inhibitory effect. (See also PHYSIOLOGY.)

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England: see GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

English Literature. In biography for 1939 the accent has remained on the late 18th and early 19th centuries. Coleridge has found, after many years, two new biographers: Sir E. K. Chambers, whose *Samuel Taylor Coleridge* might be described as a definitive précis of its subject, and Lawrence Hanson, whose *Life of S. T. Coleridge: the Early Years* is the initial volume of what promises to be the first full study of its subtle and complex hero. Mr. Hanson's judgment is, perhaps, occasionally a trifle suspect, but the voluminous and diligent documentation of his book will probably assure its place as a standard authority. The concluding volume of Ernest de Selincourt's *Letters of William and Dorothy Wordsworth* is a welcome contribution to the same field, as is Lord David Cecil's polished and scholarly study of *The Young Melbourne*. Other periods have not proved so fruitful, and apart from Sir Kenneth Clark's *Leonardo da Vinci* and Francis Steegmuller's penetrating analysis of *Flaubert and Madame Bovary* one can remember little of more than ephemeral interest.

Little noteworthy history appeared during the year 1939, perhaps because it was being made with such unpleasant rapidity. Karl Brandt's long-anticipated *Charles V* made its English debut; and Henri Pirenne, whose death has still further diminished the declining body of humane scholarship, published for the first time in England his *Mohammed and Charlemagne* and *History of Europe from the Invasions to the XVIth Century*. English historians produced nothing of outstanding importance, but in *English Scholars* David C. Douglas has given a useful and entertaining account of Restoration historical research; while in *The Englishman's Food* Professor Drummond and Anne Wilbraham have compiled a random, amusing and often valuable hotch-potch of dietary anecdote and information. The *History of the Times*, too, still like a wounded snake drags its slow length along, and has now reached 1889.

Belles lettres make a comparatively poor showing. Besides W. Force Stead's welcome edition of Christopher Smart's *Rejoice in the Lamb*, and a number of additions to the Nonesuch Library, the classics and near classics have been noticeable principally by their absence. Among the moderns, Ronald Knox (*Let Dons Delight*) has written one of his happiest parodies, Robert Lynd (*Searchlights and Nightingales*) has collected some felicitous essays, and W. H. Auden and Christopher Isherwood (*Journey to a War*) have given a slight but admirable kestrel's-eye-view of the Sino-Japanese conflict. But, as a whole, the more progressive literary movements have slowed down considerably, and the appearance of Cyril Conolly's new monthly *Horizon* hardly compensates for the disappearance of the *London Mercury* and the suspension of *New Writing*.

The death of Yeats set the tone of the poetic year. English poetry remains becalmed in a Sargasso, and Stephen Spender (*The Still Centre*), Dylan Thomas (*The Map of Love*), and W. H. Auden have done little but repeat, modify and embellish their former originalities. Roy Campbell's *Flowering Rifle*, which rhapsodizes naively over the slaughter of the Spanish republicans and vents some dubious economics, is full-blooded and makes a nice change whatever else may be thought of it. Only T. S. Eliot's *Family Reunion* showed a variation of its author's previous technique, and suggested that any of our popular poets still possesses a capacity for development.

Autobiography is still in full cry, but only *I Knock at the Door*, Sean O'Casey's purple but moving account of sordid youth in viceregal Dublin, provided the ruthless autovivisection that lovers of other people's self-analyses have come to expect. In milder vein, we had a second taste of Oliver St. John Gogarty's ribald anecdotes (*Tumbling in the Hay*) and a further instalment of J. B. Priestley's random reflections (*Rain Upon Godshill*). The usual crop of foreign correspondents gave their under-table views of current history and threw the usual slanderous sidelights on the private lives of tyrants; but Pierre van Paassen's *Days of Our Years*, though written in the lurid tradition of its kind, contains enough good new stories to make it worth remembering.

The year proved a bad year for philosophy and general science, though connoisseurs of metaphysical and anthropological curiosa will no doubt have enjoyed Gerald Heard's *Pain, Sex and Time*, and Verrier Elwin's study of *The Baiga*, an India people whose habits rival those of the Trobriand islanders. Freud's *Moses and Monotheism* has a melancholy interest as the last work of a great man, but cannot be regarded, even by his greatest admirers, as an essay of any major importance.

Not unnaturally, politics have been in the forefront of publishers' lists, and amidst all the chaff there appeared a small quantity of grain. Notable in the theoretical field was Hermann Rauschning's *Germany's Revolution of Nihilism*, a startling exposition of the nihilistic tendencies in Nazism. The same writer

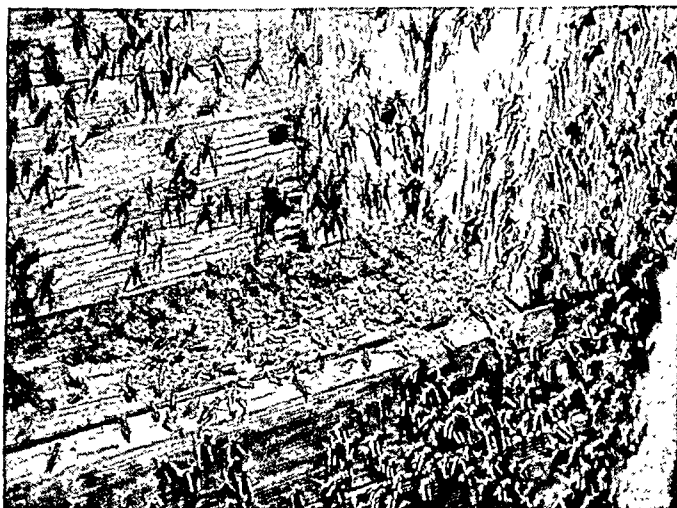
was also responsible for *Hitler Speaks*, a sensational but allegedly first-hand account of the Fuehrer's machiavellian pronouncements on his social and political policy. What Rauschning does for Hitler, W. G. Krivitski does for the Russian ruling class, and in *I Was Stalin's Agent*, offers a bitter, lurid, but fundamentally convincing exposé of the facts behind the recent Soviet purges. In the sphere of reportage, there was little outstanding, save *Fallen Bastions*, G. E. R. Gedy's able analysis of the causes and effects of Munich; and *Behind the Battle*, T. C. Worsley's sensitive and amusing story of his adventures in the Spanish Civil War. Max Werner's *Military Strength of the Powers* attracted considerable attention when it appeared, but though his praise of Germany's mechanized forces and criticisms of the Polish army have been fully justified, his confidence in the Red Army's invincibility has so far been falsified by events.

Most of the more prominent novelists published characteristic work during 1939. Aldous Huxley, slightly to the surprise of some of his readers, made a reappearance in fiction, and in *After Many A Summer* combined the cynical wit of his earlier novels and the philosophic mysticism of *Ends and Means* into an entertaining but unsatisfactory synthesis. James Joyce has at last completed *Work In Progress* and published it under the title of *Finnegans Wake*. The whole, fortunately, is greater than the parts, and the rambling brilliances of the isolated sections have merged into a work of art. *Christmas Holiday*, Somerset Maugham's new novel, proved disappointing, probably because its author was unfaithful to his familiar environment; but *To Step Aside*, Noel Coward's first volume of short stories, showed that one popular writer at least has not exhausted his phenomenal vitality. Sir Hugh Walpole (*The Sea Tower*) and H. G. Wells (*The Holy Terror*) demonstrate that they have not lost their former skill, but neither book represents its author's best work.

The younger writers have been equally active. Christopher Isherwood (*Goodbye to Berlin*) concludes, one imagines, his saga of republican Germany; George Orwell (*Coming Up For Air*) makes another pleasant excursion into his lower-middle-class inferno; Graham Greene (*The Confidential Agent*) offers an intellectual thriller; and Ralph Bates (*The Miraculous Horde*) collects a volume of short stories in his best manner. (See also AMERICAN LITERATURE.) (J. MR.)

Entomology. The "most dangerous member of a dangerous family" of mosquitoes, *Anopheles gambiae*, now menaces the Western Hemisphere. This notorious vector of malaria was discovered within the city limits of Natal on the east coast of Brazil in March 1930. The principal home of the mosquito is in tropical Africa and it probably came across the Atlantic in a fast boat or in an aeroplane. In its native home, Fosdick writes, "It is the scourge of Central Africa, a carrier of a serious and often fatal type of malaria, sometimes complicated by the so-called 'black-water' fever."

It was hoped that the mosquito would not find conditions in the region of Natal suitable to its development and that it might be exterminated. On the contrary, an outbreak of malaria due to the activities of the mosquito, of a severity unknown to the city, took place during 1930 and 1931; and by 1931 the mosquito had spread northward along the coast for a distance of 115 miles. By 1938 it had gone over 200 mi. north and west of Natal nearly to the source of the Jaguaribe river. The virulent type of malaria which it carried to this extended territory developed an epidemic which afflicted nearly 60,000 people in a population of about 70,000, of whom more than 5,000 succumbed to the ravages of the disease. So far, the mosquito does not seem to have met any adverse conditions in Brazil that have shown a tendency to check its spread.



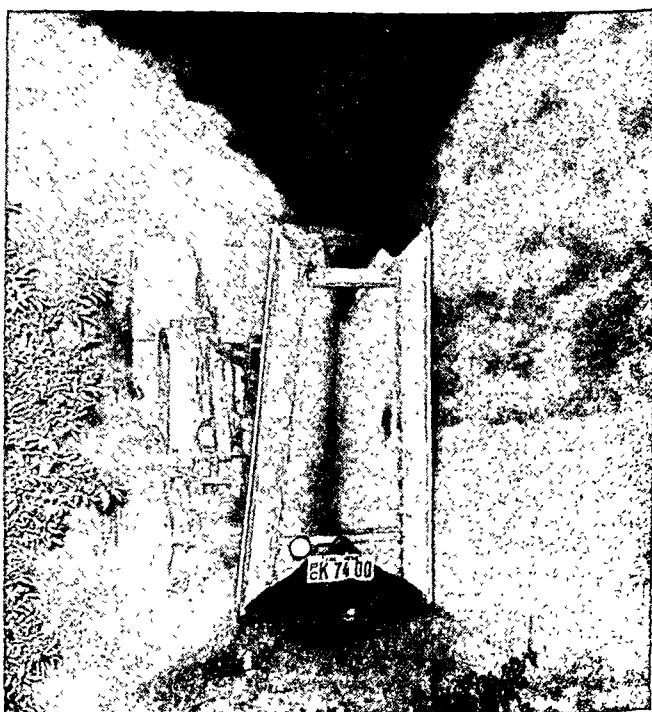
EVEN THE PAINT of farmers' homes was eaten by a horde of grasshoppers which destroyed crops along a 50mi. front in San Joaquin valley, Calif., in April 1939

Anopheles gambiae like *Aedes aegypti*, is a domestic mosquito which haunts the dwellings of man. It passes through its life cycle in 7 or 8 days, which enables it to increase rapidly and in great numbers. All of the evidence indicates that *A. gambiae* is the most dangerous vector of malaria in the hemisphere. Moreover, it seems likely, unless some method of checking its spread is devised, that it will eventually reach the southern United States in the north and Argentina in the south. "Should this occur, it would create a public health problem that would outrank all others in tropical America," Fosdick writes.

Entomological Control of Cactus in South Africa.—A remarkable effort is in progress in South Africa in an attempt to destroy the prickly pear, *Opuntia megacantha*, which densely infests well over 2,000,000 ac. in the Union, by the introduction and distribution of a moth, *Cactoblastis cactorum*, native to South America. The caterpillars of this moth live within the segments of the cactus plants eating out the soft interiors often leaving only the empty, thin, papery skins. Plants thus attacked collapse and are easily cleared from the land. During 1938, the entomologist in charge, Dr. F. W. Pettey, with his assistants, distributed 12,000,000 eggs of the moth on farms in the infested districts. To date, about 200,000,000 eggs, obtained from moths reared in three large breeding stations, have been distributed in lots of 200,000 on farms over-run with the cactus plants. The earliest established colonies of the moths have increased enormously and have spread over many hundreds of square miles. The destruction of the prickly pear plants by the caterpillars has been so extensive that there is reason to hope that the insect "will fulfil the purpose for which it was introduced." There are, however, forces inimical to the increase of the moths. Probably the worst enemy of the caterpillars is the baboons which are numerous in many localities. Curiously enough, these animals tear the leaf pads of the cacti open, pick out the caterpillars and devour them. Before distributing eggs of the moth on farms where baboons are present, the farmers are required to trap and destroy them. It is not uncommon for a farmer to trap over 300 baboons in six months' time. Monkeys and flesh-eating ants are also enemies of the caterpillars. The mucilaginous sap of the cacti also catch and destroy many of the larvae when young. Similar work against prickly pear is being carried on in Australia where the cacti have invaded a much greater area than in South Africa. The work began earlier in Australia. The *Cactoblastis* moth was introduced in 1925 and appears to breed rather more freely and rapidly than in South Africa.

The Potato Beetle in Europe.—Although the Colorado potato beetle, *Leptinotarsa decemlineata*, is an insignificant creature yet it was the subject of a good deal of attention in Europe during 1939, especially in Germany when going to war. Potatoes constitute an important food crop of peoples in northern Europe, a crop easily grown, harvested, and stored. Anything that tends to lower its production seriously becomes a source of considerable anxiety. Special effort was, therefore, made in Germany during 1939 to control the ravages of this pest. In Spain, the beetle caused trouble from a phase of its presence in that country entirely apart from its direct injury to the potato plant. Northern Spain, during past years, produced potatoes as an export crop to the British Isles. During the late civil war the beetle entered Spain, probably from France, and now the growers find themselves greatly handicapped by a quarantine against their crop because of the danger of introducing the beetle with the export shipments of potatoes. Early in 1939 while Poland still existed as a nation, an inquiry was made by an official of the Polish department of agriculture regarding the severity of the injuries caused by the beetle in the United States and the effectiveness of the spray program in holding the insect in check. The official stated that he had lately been in Holland and Belgium meeting with a committee for the study and control of the Colorado potato beetle. It is evident that the presence of this insect in Europe is looked upon as a most serious problem.

A Miscellany.—The white-fringed beetle, *Pantomorus leucoma*, formerly placed in the genus *Naupactus*, is a native insect of South America. It was first found in the United States in Alabama and Florida in 1936. It had already in 1939 spread into Mississippi and Louisiana and will probably go to other States. Although it appears to be an inhabitant of warm countries it may prove capable of living in colder regions, in which event the beetle may spread much farther north. The adult beetle is about one-half inch in length, grayish in colour and with a whitish stripe or fringe along each side of the body. It is a stout beetle with a short broad snout. It cannot fly but is active in crawling over the ground often in groups of considerable numbers. It is carried



A NEW DUST, sprayed on citrus fruit and walnut trees by a fish-tailed machine, controlled the ravages of the citrus red mite in California in 1939

to distant regions through the channels of commerce.

The beetle does most of its injuries in the larval or grub stage. The grubs often exist in the soil in great numbers, sometimes as many as 200 to the square yard. They eat off the roots of the plants on which they feed and they attack practically all field and garden crops and ornamental plants. The grubs have caused notable injury to such important crops as cotton, peanuts, beans, potatoes and sugar cane. The beetle is now so widely distributed there does not seem to be any possibility of exterminating it. Thorough and extended study of its life history and habits is in progress with the hope of finding practicable methods of checking its injuries.

The Japanese beetle, *Popillia japonica*, has gradually but relentlessly extended its area of distribution in the eastern United States until it is now present from Maine to the Carolinas through the coastal States and has crossed the Mississippi river in its westward march. Its principal concentration is still in a few of the middle Atlantic States, New Jersey, Pennsylvania, Delaware and Maryland. During the past summer (1939), some perturbation among the inhabitants of New York city was caused by the sudden appearance of considerable numbers of the beetle within the confines of the city, an awesome visitation of a strange, alarming creature.

Much careful work has been done in importing and distributing parasites to prey upon the Japanese beetle but the full effect of these parasitic forms will probably not be apparent for some years to come. On the other hand, a bacterial disease of the grubs known as the "milky disease," has developed in New Jersey which has proved to be surprisingly effective in reducing the population of the beetle. Many millions of the milky disease spores develop in the body of a single grub and the spores are capable of remaining dormant for several years yet retaining their viability during this period. The spores have been recovered from chickens and starlings and it is believed that they are distributed by birds. This disease seems to be the most hopeful natural agent that has been discovered for checking the increase of the beetle and for striking a balance in its relations to mankind. Not too much confidence, however, should be placed in the work of the disease because in other regions and under other climatic conditions it may not prove so virulent. It may be several years before the full value of the disease can be measured.

The blowfly (*Lucilia cuprina*, et al.) problem in connection with the production of sheep and wool in Australia is still a serious one. Intensive investigation of the habits, life history, and ecological relations of the flies is in progress. One of the essential requirements of this work is an ample and regular supply of the larvae for the laboratory and field experiments. To fulfil this demand, the larvae must be reared artificially on some sort of synthetic medium. Yeast in combination with sodium chloride with enough agar added to give the right consistency, has proved satisfactory. The larvae grow more rapidly, however, if the white of egg is used in place of the agar. In case of the yeast medium, it is believed that no previous record of the successful rearing of "flesh-fly larvae" in the absence of animal protein is known. This is an interesting by-product of the investigation.

Insects of the Air.—A summary of an extraordinary series of collections of wind-drift insects in the air at altitudes varying from 20ft. to 15,000ft. has been published. The insects were collected in specially constructed traps fitted to the wings of various types of monoplanes and biplanes. The work was performed mostly in the United States in the State of Louisiana, but a limited amount of collecting was done in northern Mexico. In all, 30,033 specimens of insects, spiders and mites were collected at the various altitudes. It is of interest to note that in Louisiana at altitudes



JAPANESE BEETLES (magnified approximately three times) spread to 16 eastern States and to Ohio in 1939. They destroy trees, vegetables, grain and flowers

of 200ft. a total of 13,389 specimens were taken, all of which, except 653 spiders and mites, were true insects (Hexapoda). At an altitude of 1,000ft., 4,376 insects were collected, while at a height of 2,000ft., 2,127 insects were caught in the traps. Varying, but lesser, numbers were taken at other altitudes and 10 insects were caught at a height of 14,000 feet. Specimens were taken in every month of the year but most, per ten minutes of daylight flying time, were collected in May while the least number in the same flying time was taken in December and January. It is rather surprising that numbers of wingless adult insects as well as nymphs and larvae were collected from the air even up to altitudes of 14,000 feet.

Temperature proved to be the most important factor governing the number of insects in the air at any given time. A surface temperature of 75° to 79° F. appeared to be the most favourable for insects to take to the air. The velocity of wind currents influences greatly the distribution of insects through the air. When the velocity of the wind at the surface was 5 to 6mi. per hour the largest number of insects at the lower altitudes was taken. In speaking of the wingless specimens taken at altitudes above 5,000ft., P. A. Glick says it is likely that these forms were "carried in the upper air currents, perhaps for hundreds of miles. By means of these avenues of travel insects have been distributed to far countries, to remote islands, over mountain barriers and across stretches of hot, barren deserts and waste lands."

Locusts and Grasshoppers.—Grasshoppers and locusts are still among the most destructive crop insects in the world. Huge swarms of locusts were reported during the year in Argentina, South America. The Government ordered navy aeroplanes, equipped with tanks containing special toxic chemicals, to spray the swarming insects.

From large areas in the western United States came early reports of invasions of grasshoppers. An emergency Federal appropriation of \$1,750,000 was given to the Department of Agriculture to finance the fight against the insects. In addition, several States supplemented the Federal funds with appropriations of their own.

All of the area of the Great Plains region from Montana to Texas and eastward to Wisconsin and Missouri suffered from the ravages of grasshoppers. The Pacific Coast States also were subjected to severe injuries in various localities. Colorado "experienced the worst outbreak of *Dissosteira longipennis* in the agricultural history of the State, embracing an estimated infestation of over 4,000,000 ac. of native sod land." It is estimated that the value of the crops and range destroyed exceeded \$5,500,000.

In North Dakota the locust, *Melanoplus mexicanus*, was the predominant species. On the whole, the damage to crops in the State was less than in 1938 due largely to the effective methods of control. A survey has shown that throughout the northeastern part of the State the deposition of eggs has been abnormally large, a condition which presages a severe infestation of grasshoppers next year in that region. (See also MALARIA.)

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Epidemics and Public Health Control.

One great advance in the control of communicable diseases was the development and use of sulphanilamide and sulphapyridine, especially in pneumococcus pneumonias. Siler and Dunham have shown that "revaccination against typhoid fever of previously immunized persons with one intracutaneous dose of 0.1 cc. of typhoid vaccine produces an immunologic response which is comparable to that following original vaccination with three subcutaneous injections of vaccine."

Transmission of the viruses of the Eastern and Western strains of equine encephalomyelitis to man appears to be a probability. From epidemiologic evidence it seems likely that the equine virus is transmitted to man through some vector. Neutralizing substances of the Western strain have been found in sera of 32 out of 86 encephalitic cases diagnosed in 1937 and 1938.

Bundesen, Fishbein and White point out that the results obtained in diphtheria prevention with toxoid inoculations did not approximate expectations. By employing antitoxin determinations of the blood in children previously inoculated with various types of antigens, they indicate that three doses of the plain toxoid at monthly intervals seemed to give the best results. There seems to be a gradual loss in the antitoxin content of the blood with the passage of time. They recommend, therefore, the revaccination of children with one dose of some antigen at intervals of from three to five years in order to maintain a sufficiently high level of antibodies to ward off the disease.

Successful transmission of the Lansing strain of poliomyelitis virus to the Eastern cotton rat was reported by Armstrong from the National Institute of Health. The strain has been carried in series through seven cotton rat transfers, and animals of the eighth transfer had begun to develop symptoms at the time of reporting. Paralysis of the flaccid type developed in all. This animal is not vicious, multiplies readily in captivity, and, in view of the probable interference with the importation of monkeys during the European war, may prove invaluable in continuing experimental investigations of infantile paralysis.

Some investigators are inclined to deduce from serologic evidence that the virus of swine influenza is a surviving prototype of the agent primarily responsible for the great human pandemic

of 1918. Shope is of the opinion that "Lungworm larvae from pigs with swine influenza harbour swine influenza virus throughout their development both in their intermediary host, the earthworm, and their definitive host, the swine. The virus apparently lies latent within the lungworm after the parasite has finally migrated to the swine respiratory tract and is only liberated or activated to cause infection when a provocative stimulus is applied." In his hands multiple intramuscular injections with living *Haemophilus influenzae suis* cultures or a single intraperitoneal injection with calcium chloride solution were equally effective as this potentiating agent.

If these facts are so, then hogs and earthworms may conceivably serve as the source of some future human epidemic of influenza. (For syphilis control see VENEREAL DISEASES.)

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Epilepsy: see NERVOUS SYSTEM.

Episcopal Church: see PROTESTANT EPISCOPAL CHURCH.

Equatorial Islands: see SOUTH SEA AND EQUATORIAL ISLANDS.

Eritrea: see ITALIAN COLONIAL EMPIRE.

Estonia, area 18,371 sq.mi.; pop. (est. Jan. 1, 1939) 1,133,940. Chief towns: Tallinn (cap., 145,000), Tartu (60,500); Narva (24,000); Nõmme (21,900); Pärnu (21,500). President: Konstantin Päts; language: Estonian; religion: Christian (Lutheran 75%, Greek Orthodox 19%).

History.—While the Anglo-Russian negotiations were in progress, Estonian opinion was more favourable to the Anglo-French proposals for limited assistance if such assistance should be required by Estonia, than to the Russian proposals to guarantee her either with or against her own consent. After the conclusion of the Russo-German pact in August, however, Estonia saw no choice but to accede to the Soviet demands for the lease of naval and air bases in the islands of Ösel and Dagö and the town of Paldiski, and on September 29 she concluded with Russia a pact to that effect, ratified on October 2. This was followed on October 8 by the resignation of the Government, and on October 10 M. Uluots formed a new government, with M. Piip as foreign minister. The incident of the escape from Tallinn on September 18 of the interned Polish submarine "Orzel" led to the dismissal of the commander-in-chief of the navy and the chief of the naval staff. On October 18 telephone and wireless communication with places abroad was prohibited, and a censorship of postal and telegraphic communications abroad and of telephonic communications at home was instituted. Repatriation to the Reich of German Balts in Estonia began on October 20 and was completed on November 14. Of the 15,000 eligible, 10,000 are said to have emigrated, and 3,000 to have chosen to remain in Estonia. A Government bill provided for the compulsory liquidation of the possessions of repatriated Germans, the estimated value of German property in Estonia being 500,000,000 kroons.

Education.—Schools: elementary 1,224; secondary 132; universities 2.

Banking and Finance.—Revenue (est. 1939-40), 105,878,187 kroons; expenditure (est. 1939-40), 105,816,637 kroons; public debt (March 31, 1939) 127,092,630 kroons; notes in circulation



"WHILE THE SUN SHINES." This cartoon by Little of *The Nashville Tennessean* was drawn after Russia signed the first of its series of dictated Baltic pacts—with Estonia on Sept. 29, 1939

(Aug. 31, 1939) 57,000,000 kroons; gold reserve (Aug. 31, 1939) 40,900,000 kroons; exchange rate (1939) 18.11–18.35 kroons (Ekr.)=£1 sterling.

Trade and Communication.—Foreign trade (merchandise): imports (1938) 107,198,000 kroons; (Jan.-Aug. 1939) 73,446,000 kroons; exports (1938) 103,928,000; (Jan.-Aug. 1939) 77,847,000 kroons. Communications and transport 1939: roads, suitable for motor traffic 12,343mi.; railways 889mi.; shipping (June 30) 177,200 gross tons; motor vehicles licensed (Jan. 1, 1939) 8,896.

Agriculture, Manufactures, Mineral Production.—Production in 1938 (in metric tons): shale oil 140,000; wood pulp 90,800; potatoes 997,600; milk 975,500; rye 188,000; (1939) 204,300; wheat 85,400; (1939) 80,700; butter (export) 14,730; flax (fibre) 7,600; paper and paper boards 19,300. Industry and labour: industrial production (1929=100) (average 1938) 145.5; (July 1939) 162.6; index of employment (1929=100) (average 1938) 146.8; (July 31, 1939) 155.6; applicants for work (average 1938) 1,233; (July 31, 1939) 460.

Etching. The art of etching, as practiced throughout the world in 1939, continues to grow in favour among both artists and laymen, both nationally and internationally. With the increased tempo of modern life, the wider distribution of wealth, and the trend towards smaller homes with consequently less wall space for the accommodation of pictures, the etching, which is smaller, easier to handle, less costly, and, since by the inherent nature of the process capable of multiplication, susceptible to wide distribution, is steadily gaining in popularity as a means of original graphic expression. First practiced, in the sense in which we know it today, in Germany and the Low Countries in the 16th and 17th centuries, etching had its great period in Italian art in the 18th, its Golden Age in France in the 19th, and today finds its broadest outlet in England and the U.S.A.

Since the death of Forain, France has had no great leader in the field of etching, yet Achener, Adam, Berg, Bonnard, Boullaire,

Cami, Goërg, Grandgérard, Guastalla, Laurencin, Legrand, Lévy, Maillol, L.-A. Moreau, Myr, Orovida, Picasso, Possoz, Rouault, Rouvière, Segonzac, Villon and Vuillard are carrying on the great tradition of French etching in all its phases.

Neither in Italy nor in war-torn Spain have any new etchers of significance arisen during 1939. In the former country the traditional style has been carried on by Barriviera, Bellotti, Boglione, Luthmann, Mainini, Mauroner, Petrucci, Pietra and Mazzoni-Zarini, while the Spaniard Dali, working in the United States, has produced some prints noteworthy for the beauty of their linear quality.

Little of importance has come from Germany, the existing form of government being unsympathetic to original artistic expression. The greatest living German etcher, Kaethe Kollwitz, is now an aged woman, and contemporary work on copper is being carried on by Jansen, Luiko, Mayer, Richter, Schultheiss and Sintenis. Polish print makers of today have devoted themselves largely to the block-print, but Konstanty, Bernard, Maria, Ignacy, Zofia, Ludwik and Wladyslaw have worked upon copper and were represented in the Polish Pavilion at the New York World's Fair (1939). Among the etchers of Hungary and Czechoslovakia, Julius Komyáti and J. C. Vondrous, the former trained in England and the latter in the United States, have produced fine figure subjects, landscapes and architectural plates. Other contemporaries are the Hungarians Poharnok, Szönyi, Weil and Zádor.

Arabia continues to be represented by Barada; Argentina by Bernado, Castagna, Lasansky and Villafañe; Belgium by Danse and Heymans; Bulgaria by Nenoff and Staikoff; Canada by Taylor; Finland by Tandefelt and Segerstråle; Holland by Ykelenstam; India by Dey; Mexico by Avila; Palestine by Wittenberg; Sweden by Johanson, Sparre and Veslen; and Switzerland by Lieven.

Due, probably, to the firm roots of conservative art in England and the many excellent schools where the traditional spirit is fostered, British etching has been less affected by the so-called "modern" influence than has that of any other country. A large section of the annual exhibition of the Royal Academy is devoted to prints, and the Royal Society of Painter-Etchers and Engravers, now headed by Malcolm Osborne, holds a comprehensive annual London exhibition of the work of its members. The famous triumvirate of Scottish etchers, Bone, master of the dry-point medium, McBey and Cameron, the last named now inactive in etching, head any list of contemporary British etchers. Others who have published and exhibited work during 1939 are Aspden, Austen, Brammer, Briscoe, Buckton, Burridge, Cown, Currey, Delleany, Dent, Drury, Earthrowl, Fisher, Freeth, Gibbs, Gill, Hardie, Hayes, Hope, Hudson, Janes, Josset, Kemp-Welch, Moody, Osborne, Robins, Smart, Spence, Squirrel, I. Strang, Taylor, Thompson, Van Abbé, Warlow and Woollard. Brockhurst, famous for the extreme refinement of his technique, has visited the United States and held two large exhibitions of his etchings in New York city.

Etching in the United States is probably more active than in any of the major centres in Europe, due to the unsettled conditions existing in the latter. The three leading print societies, the Society of American Etchers, the Chicago Society of Etchers and the Print Makers' Society of California, together with numerous other similar organizations all over the country, held their regular annual and travelling exhibitions, while under Government administration an extensive program was continued in the field of prints, the work so produced being assigned to various public institutions, such as museums, libraries and schools. Although Benson, the famous etcher of wildfowl, is no longer active, J. E. Allen, Bacon, Berdanier, I. Bishop, R. E. Bishop, Bobleter, Borne, Botke, Botts, Butler, Cadmus, Chamberlain, Cook, Costigan,

Daniel, Detwiller, Eby, Frame, Ganso, Grant, Handforth, Heintzelman, Higgins, Hoffman, Hutty, Kappel, Kloss, Kupferman, Landeck, A. Lewis, M. Lewis, Loggie, Lucioni, Margulies, Marsh, H. Miller, K. H. Miller, McNulty, Nisbet, Osk, Ostrowsky, O'Toole, Partridge, Petersen, Price, Reynard, Rosenberg, Roth, Ryder, Schladach, Sloan, Sterner, Tittle, Vargish, Washburn, S. M. Weber, Williams, Winkler, Woiceske, C. H. Woodbury, G. Wright, R. S. Wright, M. Young and H. Webster, the last named living in Paris, all produced new work in 1939. During 1939 American etching lost two significant figures, L. Easton and the veteran G. E. Burr. The most comprehensive and representative exhibition of contemporary American prints ever brought together, consisting of 408 examples, was assembled by an elaborate jury system for the New York World's Fair. Another occurrence of importance in the print field was the organization of a National Committee of Engraving, along lines similar to those followed by corresponding bodies in France and England, for the purpose of promoting the interests of prints both nationally and internationally, chiefly by the interchange of exhibitions between the countries of the world.

(J. T. Ar.)

Ethical Culture Movement. A new type of religious fellowship, founded in New York in 1876 by Felix Adler, and in London in 1886 by Stanton Coit. Instead of agreement on a common theological creed, the basis is "dedication to the ever-increasing knowledge, love and practice of the Right." Extension of ethical knowledge is considered equally important with improvement of practice in personal, social, political, national and international relations. The American Movement is represented by active societies in New York, Chicago, St. Louis, Philadelphia, Brooklyn and by groups in West Chester and elsewhere. These are united in the American Ethical Union (secretary, George E. O'Dell; headquarters, 2 West 64th st., New York), which holds annual conferences and publishes a monthly magazine (*The Standard*) and other literature. The first social settlement house in America was established by the Ethical Movement, which also pioneered in establishing district nursing and legal aid to the poor, housing reform, and improved methods of education. (Schools are conducted by the New York and Brooklyn Societies; also social settlements by the New York, Chicago and Philadelphia Societies.) In 1939 much work was done in aiding refugees from German persecution. The New York Society organized the Good Neighbor Committee (interdenominational) for this and other co-operative purposes. The English Ethical Societies are organized in an Ethical Union (chairman, Lord Snell, 12 Palmer st., London, S.W.1.).

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Ethiopia: see ITALIAN COLONIAL EMPIRE.

European War. The Contributory Causes.—On Sept. 1, 1939 the European war, the most unpopular war in history, began with the German invasion of Poland. The duration and consequences of this war lay far beyond the horizon of reasonable predictions. The basic causes appear quite clear. As the last year of the fourth decade of the 20th century opened, approximately two-thirds of the world population were engaged in war. In Western Europe six nations were actively engaged in conflict on land and sea and in the air, with nearly 13,000,000 men under arms; while hundreds of millions of nationals turned away from peaceful pursuits to face the precarious existence of the civilian in war time. The 25 years between 1914 and 1939 had

the character of a great tragedy. The World War (1914-18) raised no victorious nations and filled men with a loathing for war and the conduct of war. Through the period 1920 to 1928, the world community adopted agreements in politics and economics designed to more closely approach a more permanent peace based upon democratic forms, seeking social justice for all creeds, all classes and all men in all societies. Democracies saw responsible Governments waver and fall before the onslaughts of depression and dictatorship. Democracies failed to find a solution for internal problems, and looked across troubled frontiers toward neighbours faced with similar problems and joined in common apprehension. The progress and the optimism of the '20s gave way to the paralysis and the disillusionment of the '30s. Millions realized that a crisis was at hand, yet all hoped that war might be rejected as a solution.

(a) *Europe Prior to the Munich Agreement.*—The period between Jan. 1936 and the Munich Agreement in Sept. 1938 records the triumph of totalitarian government over the system of collective security adopted after the World War (1914-18). The list of triumphs is impressive. The Spanish Civil War in which Russia, Germany and Italy were implicated, the Sino-Japanese military conflict blandly classified as an incident, British experiments in European diplomacy without benefit of the blessings of the League, the proposals for reform or revision of the Covenant of the League, and the German annexation of Austria, all were steps toward the final victory. Early in 1936, England and France were unable to reach agreement on the adoption of sanctions against Italy engaged in the conquest of Ethiopia. The failure of these major states to find a common solution within the framework of collective security procedure opened the door to prompt and vigorous action by the totalitarian states in pursuit of wider advantages. Concurrently, the weaker states regarded the failure as ill omen for future security of the system in which they had placed their collective faith.

In March 1936, Germany announced that the Treaty of Locarno was considered non-effectual and the Reichswehr occupied the Rhineland. The French and British Governments again failed to rally to the support of proposals of condemnation of this new breach in the system of treaty agreements. The nations of Europe accepted the growing disintegration of leadership with increased concern for their own safety and with rapidly rising fear and suspicion of the complete failure of the post-war system. Proposals and counter-proposals for remodelling the Covenant of the League were the subject of heated debate, but found cold reception during the balance of the year of 1936. In England, Neville Chamberlain succeeded Stanley Baldwin as prime minister in May 1937. In June, Monsieur Chautemps rose to power in France. British foreign policy abruptly changed from adherence to the methods of collective agreement to the pursuit of solutions best for the British alone, and the result of direct negotiations.

Domestic disturbances in France and the consequent insecurity of the Government shook the confidence of her allies. Poland appeared to accept the growing control of Germany in Danzig. Belgium adopted a neutral attitude as a national policy. Yugoslavia drew closer to Italy, and Rumania became preoccupied with the extensions of a more rigid monarchical rule. In republican Czechoslovakia the Sudeten question burned more fiercely under German blasts against the independent Government leaders. In Russia a series of purges among political and military figures resulted in practical isolation from Western Europe. The Little Entente lay dying. The Franco-Soviet pact appeared dead.

The Nov. 1937 agreement between England and France signalled the formal adoption by Mr. Chamberlain, with French approval, of his experiment in appeasement. The former leaders in the establishment and maintenance of the post-war system of collec-

tive security, in joint negotiation, announced the desire of their governments to co-operate with all countries in the common task of promoting international appeasement by methods of free and peaceful negotiation. It is significant that the League was not mentioned. This announcement followed by a few days the public notification by Germany, Italy and Japan of a common anti-Communist protocol. Far from seeking a solution to joint problems by negotiation, the protocol pointed a warning finger toward the creation of a world order in which the really vigorous nations could live together.

In Dec. 1937, the Rome-Berlin Axis became a reality when Italy withdrew from the League of Nations and Germany announced that her return to Geneva would never be considered.

In Feb. 1938, Anthony Eden resigned from the Government in England and Mr. Chamberlain rejected the imposition of sanctions and use of force in the solutions of European problems. Within a month Germany annexed Austria without fear of French or British interference and in disregard of Treaty restriction or League guarantees. (See also LEAGUE OF NATIONS.)

In April Mr. Chamberlain concluded an Anglo-Italian agreement directly with Premier Mussolini in pursuance of his announced intention for free negotiation. The smaller states in Europe swung sharply away from the closely co-operative post-war commitments and sought refuge in the bravely defiant announcement of neutrality in the event of the future hostilities they sensed just beyond the horizon. The climax in the conflict between force and free agreement approached ominously and with devastating speed. August was filled with alarms and intense excitement, the result of the Czech crisis. The demands of Germany were clear and the intentions obvious to all observers.

Above all other events during the period since Jan. 1936, the question of the defence or the desertion of the Central European republic stood paramount above all others. The definite repulse of totalitarian methods or the rejection of collective security and post-war agreements remained a decision for Great Britain and France. Britain continued the pursuit of free negotiations, and Mr. Chamberlain opened direct negotiations with Adolf Hitler at Berchtesgaden and Godesberg. On Sept. 29, 1938, before a paralyzed and bewildered world, France and England joined Germany and Italy at Munich. The policy of conciliation to the dominant power politics of the totalitarian states resulted in abandonment of the post-war system of collective security and the rule of law, and in the victory of power politics and the rule of force.

(b) *The Munich Agreement and Appeasement.*—The terms of the agreement accepted at Munich may be summarized as follows:

- (1) The Czechoslovakian Government to withdraw from the frontiers of Bohemia and in the adjoining territories claimed by Germany; withdrawal to be made between October 1 and October 7.
- (2) The conditions governing the evacuation of additional territory and the determination of additional areas of predominantly German character to be decided by an international commission, with members from Germany, Italy, France, and Great Britain, allowing occupation of these areas not later than October 10.
- (3) The Czech Government to be held responsible for the maintenance of all existing installations.
- (4) The international commission to determine areas in which plebiscites were to be held not later than November 30.
- (5) The final delimitation of the new frontiers to be determined by the international commission.

These agreements were presented to the Czechoslovakian Government representatives, M. Jan Masaryk and M. Mastny, on Friday, September 30, by Mr. Chamberlain and M. Daladier.

It is reported that the Czech representatives were not allowed to participate in the preliminary discussions which led to the final agreement, and further that they were advised to accept the decisions promptly and without protest. M. Masaryk has been quoted in comment on these circumstances substantially as follows: "It was a matter of condemnation without appeal and without possible modification." The end of independence was in sight for Czechoslovakia. War in its combat phase had been

averted. However, the conclusion of the Munich Agreement marked one more phase in the "white war" or war of nerves.

Mr. Hitler and Mr. Chamberlain reached another agreement at Munich which requires examination. This agreement took the form of a statement of three clauses expressing their joint opinion on the future relations between Britain and Germany. In effect the clauses were:

- (1) That the question of Anglo-German relations was of the first importance for the two countries and for Europe.
- (2) That the Munich Agreement and the Anglo-German Naval Agreement were symbolic of the desire of the two peoples never to go to war with one another again.
- (3) That the manner of consultation should be the method adopted to deal with in every question concerning the two countries, and that efforts should be continued to remove possible sources of difficulty and thus contribute to assure the peace of Europe.

This agreement appears to be no more than an expression of opinion by the two individuals who signed it. It indicates clearly the desire of Mr. Chamberlain to pursue direct negotiations outside the field of collective security procedure. It was not considered a treaty by the German Government, although it appears to have been accepted by the British prime minister as a charter for continuing the policy of appeasement. Mr. Chamberlain stated that he considered that the Munich Agreement would give Czechoslovakia "a greater security than she had ever enjoyed in the past." And it is equally true that he considered his agreement with Adolf Hitler on Anglo-German relations to give all the peoples of Europe a greater security than had been possible up to that date.

The Munich Agreement marked the beginning of the close of the policy of appeasement practised by England and France toward the central power of Europe—Germany. It is true that as late as March 1939 the British Government assured journalists that the policy of appeasement had never shown greater success in ensuring an era of peace in Europe, but this assurance was based upon wishful thinking rather than a record of practical accomplishment in the direction of attaining peace. The policy of appeasement had been adopted in an attempt to placate those nations who challenged the post-war system of collective security. An analysis of the policy indicates that it resulted in frequent financial assistance to Germany and Italy, the promised and occasional reduction of armaments and finally in the acquiescence and conquest of weaker states. Opponents of the policy of appeasement considered it evidence of political intransigence, fear of a major European upheaval, and shabby irresponsibility toward the destiny of the weaker states of Europe and Africa. Those in favour of the policy offered evidence that it resulted from a growing concern for the stability and preservation of moral, political and economic values in modern Europe.

It is quite probable that historians will consider the policy to have been a natural development of the post-war demoralization which for 20 years permitted apathy and indifference to be ever-present at European conference tables. Leaders avoided the duties and responsibilities of high office. Integrity was the exception rather than the rule. Standards were lowered in the conduct of interstate relations. Defeatism and cynicism captured the weak, and defiantly proclaimed the "aggression" to be "pacification."

(c) *The March to Prague.*—The march of the German Army into Prague closed the period of the independent rule of law in Czechoslovakia, shocked Britain into a realization of the practical dangers facing the Empire, aroused Western Europe to the imminent horrors of war, and swung world opinion sharply away from tolerance toward totalitarian methods to abrupt protests against further aggression. The important steps in the actual invasion and capture occurred in March 1939. On March 10 a revolt against the Prague Government was organized in the Province of Slovakia. On March 13 the German Army troops in Bavaria and Austria moved up to the Czech frontier. On March

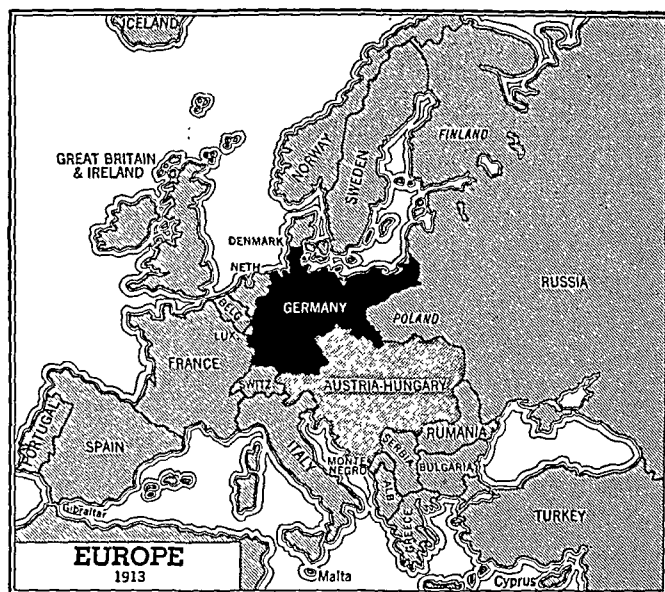
14, M. Hacha, the President of the Republic, was summoned to Berlin. It appears that a demand was presented to him for agreement which would result in the final disappearance of any independent government in the remaining territory under Czech rule. Whether the agreement was presented as a demand or arrived at freely by mutual consent is not known to this writer. However, the following statement was issued on the morning of March 15, 1939: "The Czechoslovak President has declared that in order to reach a final pacification, he would place the fate of the Czech people and their country confidently in the hands of the Fuehrer of the German Reich." The action of the German army was swift and overwhelming. Within three hours following the announcement quoted above, the German armies occupied Bohemia and Moravia. Adolf Hitler entered the city of Prague at 7:15 P.M. that evening. Without a single armed conflict of any serious importance and with the incredible speed which had become standard practice in the "white war" of nerves, Germany had captured the last remaining stronghold of Czechoslovakian independence. Another victory for power politics had been secured.

The reaction in England was a prompt and complete reversal of the Government policy of appeasement. On the 17th of March, 1939, speaking at Birmingham, the prime minister is quoted as saying: "Is this the end of an old adventure or the beginning of a new? Is this the last attack upon a small state or is it to be followed by others? Is this in fact a step in the direction of an attempt to dominate the whole world by force?"

The dangers that had been feared in September prior to Munich gave way to the empty victory resulting in "peace with honour." The swing from appeasement began gradually after Munich and continued slowly until the middle of March. The German march into the city of Prague killed the policy of appeasement and Allied public opinion rallied to the support of measures looking toward security based upon the strength of arms. England and France were determined to meet force with equal or greater force.

(d) *German Racism Gives Way to Imperialism.*—It is important to consider not only the reasons which supported Allied acceptance of German methods prior to the march on Prague, but to consider as well the Allied opposition to German methods after March 15, 1939. It is clear that England and France agreed and accepted the principle that Germany sought to establish the rights of self-determination for all Germans living outside the Reich. This was the constant claim of the Nazi Party and the consistent appeal of the German Government. It has been expressed in the slogan, "One people, one Reich." The social revolution in Germany was considered to be a result of a growing demand for the reincorporation of German people within the borders of the German State. The methods of regimentation of the German nationals, the frequently terroristic methods of control of minorities within the State, the adoption of repressive measures to control the franchise and the press, the arbitrary demands for expansion of State boundaries at the expense of neighbouring nations; these were not approved by the Allies as polite means or procedures in a modern world familiar with the system of collective security and joint negotiations. However, through the chain of disagreeable incidents there were links which supported the Allied view that Germany had a morally acceptable right to demand that all Germans belong within one German State. So long as the creed of racialism supported the claims of the Nazi Party and the demands of the German State, the result was to set up a favourable, if rather luke-warm co-operation by England and in turn by France.

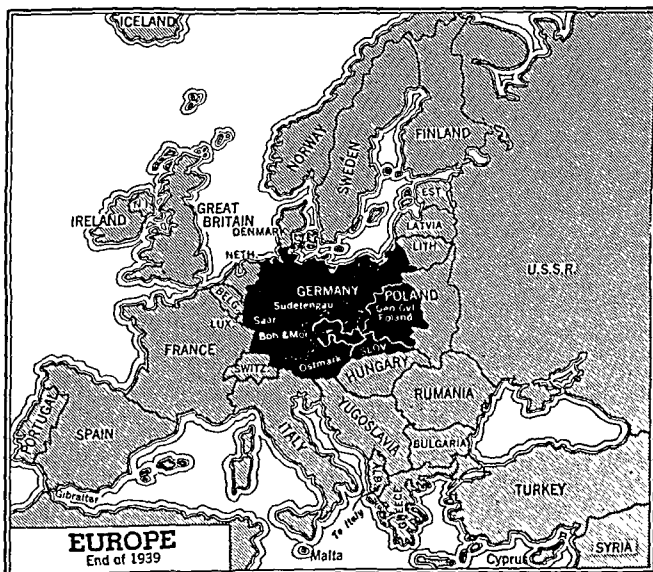
The reoccupation of the Rhineland, the remilitarization program, the acquisition of the Saar, the annexation of Austria and the German victory at Munich; all were acceptable only because the doctrine of racialism—one creed for all citizens, one people,



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one Reich—was continually advanced as support for the German demands. The denunciation of the Treaty of Locarno and the march to Prague were startling examples of the change from a German policy of racialism to a German state policy of imperialism. The march to Prague was a march out of the pages of *Mein Kampf* and away from the dogma of the Nazi Party in the direction of conquest in the grand manner. The era of Pan-Nazism had ended. The era of demands, supported by morally acceptable and reasonably intelligent claims, was succeeded by violent excursions into the field of invasion by armed force over the territory of weaker nations. Until March 15, 1939, Germany had taught Western Europe how to hang an olive branch on a bayonet. After Prague the Allies severed the symbol of peace with a sharp blade of distrust forged in the hate of an aroused resentment.

(e) *Appeasement Succeeded by Rearmament.*—Shortly after the Munich Agreement, England and France began preparation for rearmament. In England plans were announced for raising approximately 19 divisions totalling 300,000 men, and estimates were drawn for mechanization for as many of these divisions as possible. Naval construction was increased and provisions were made for extended training of naval reserves. Limited conscription was adopted without serious protest in Parliament or throughout the country. Plane construction was speeded up, and the air industry received substantial subsidies from the Government. Preferred treatment for labour and management assistance was provided in order to assure efficiency in British industry. Orders were placed in the United States for aircraft and for some essential items of aeroplane equipment. A national program for A.R.P. (Air Raid Precautions) received wide publicity throughout the nation. Every British citizen was made aware of the dangers to be expected from the sky and all were instructed in self-protection and assistance in the protection of others in the event of air bombardment. Complicated plans were drawn up for the evacuation of children from metropolitan centres, and in turn residents in the less populated districts were asked to provide shelter and care for the thousands of youngsters removed from the city. All these activities were evidence of a determined view to be prepared for adequate defence. They do not appear to have been evidence of a nation-wide desire to engage in war.

In France similar activities were undertaken with the speed that a mixed political situation would permit. French reserves were given warning notice of a probable call to the colours in the near future. Labour was persuaded to accept a modification of recent provisions allowing a 40-hour week. Pending disputes between labour and industry were partially settled by Government intervention. French manufacturers were requested to speed up production of essential war materials, and the aviation industry received special attention of the Government. Extensive renovations had to be made in plant equipment in order to bring the level of plane production up to a comfortable margin of security. In all departments of the armed forces, in labour, in industry and throughout the civilian population, France began to prepare for the war to come.

Throughout Europe nations, large and small, turned away from the vanishing prospects of peace and with feverish haste began to look to their defences for war. Conciliation had resulted in capitulation, force had finished the fight for freedom. Racialism had given way to imperialism, and appeasement was followed by the race to rearm and defend. (See also AIR FORCES; ARMIES OF THE WORLD; CHEMICAL WARFARE; NAVIES OF THE WORLD.)

(f) *The "White War" or War of Nerves.*—It is clear that the pursuit of state policy, by the use of threats of force during negotiations, as distinguished from the familiar use of force on the field of battle, has introduced a new type of state warfare. It has always been recognized that the smooth road of conquest runs

across the polished surface of international conference tables. Yet the modern world has seen the development of a new technique in the application of this invisible but potent force during the last few years. The deliberate use by totalitarian states of the threats of force, the practice of launching violent verbal and press attacks, and abusive criticisms against the Governments of neighbouring states, the promotion of civil disorders within and among minority groups in adjacent territories, the vociferous claims of wounded pride and dignity due to alleged denials or delays in the immediate rectification of so-called "just" claims; these distinguish the methods employed in the "white war" of nerves.

At no time has this new technique been more evident than in the conduct of interstate relations in Western Europe during the period 1936–39. The final pre-war phase of "white war" began after the march to Prague in March 1939, and ended in Sept. 1939.

(1) *German Demands on Poland.*—On March 24, 1939, Germany presented a series of demands to the Polish Government in Warsaw. The date of these demands gains added significance when it is realized that they were made one week following the establishment of a German protectorate over Bohemia and Moravia. The demands included the following:

The return to Germany of the Free City of Danzig. Poland to be assured a free zone in Danzig by Germany.

The right to construct a German motor highway and railway across the Polish Corridor between Germany and the Province of East Prussia.

The suggestion that Germany might offer to conclude a 25-year non-aggression pact with Poland and accept the altered Polish boundaries as permanent.

Impartial observers consider these German demands at least partially justified. Poland, when reconstituted by the Paris Peace Conference in 1919, included nearly 11,000,000 non-Poles representing 30% of the total population of the new state. Over 1,000,000 of this total were Germans. These former German nationals, living in former German territory in the provinces of Poznan, Pomorze and Silesia, considered Polish rule intolerable. They constituted a small but determined minority opposed to the new Polish Government, and supported in this opposition by willing encouragement from the powerful Fatherland—Germany.

In Danzig (*q.v.*), which was a predominantly German city in 1919, an international commission, under League of Nations control, administered the Free City by means of a local legislative body. The city was a great asset to the economic welfare of Poland despite the recent construction of the new Polish port of Gdynia. The further possibility that Germany might acquire the city as the first step in a general reoccupation of the Corridor made Poland defiant in her refusal to accept the German demands. The Government of Poland had many internal flaws and was considered a military dictatorship.

Minorities were allowed a minimum of freedom in respect to the franchise or the exercise of other national rights accorded citizens in democracies. It remains true, however, that the German methods of presenting their demands and the technique of the "white war," plus the British and French offers of assistance made to Poland, combined to prevent calm examination of demands which might have had considerable merit.

On May 5, Foreign Minister Beck firmly refused to consider any German demands on the Polish state. During the last week of Aug. 1939 a set of German demands on Poland was the subject of last minute consideration prior to the outbreak of the combat phase of the war.

(2) *British and French Attempts to Create a Non-Aggression Front.*—Britain reversed an historic policy of no alliances with states outside of Western Europe when it exchanged pledges of mutual assistance with Poland and Turkey and made formal guarantees to Greece and Rumania in 1939. France already had a treaty of assistance with Poland and followed Britain's lead in making new pledges to Greece, Rumania and Turkey.

Both countries were determined to create as promptly as possible a bloc of small nations joined in common resistance to further German expansion by a continuation of the technique of a "white war." A non-aggression front was the objective of the two states. Their efforts were taken swiftly and in complete agreement that the hope for peace could be supported by such guarantees.

On March 31, Britain announced that the Government saw "no" justification for the substitution of force or threats of force for the methods of "negotiation" in the German-Polish dispute. Britain felt bound to lend support to Poland if any action occurred which "clearly threatened Polish independence," and which the Poles "considered it vital to resist with all their national forces." France was already pledged to assist Poland with respect to the support of the independence of that state.

On April 13—shortly after Italy had assumed control in Albania—Britain pledged all its support to Greece and Rumania in the event the independence of either was threatened and that resistance was made by the armed forces of these nations. France confirmed these pledges and joined England in the expansion of the non-aggression front. On May 12 England offered a pledge of assistance to Turkey in the event of an act of aggression leading to war in the Mediterranean area. And on June 23 France and Turkey exchanged identical agreements, and the Republic of Hatay (the Sanjak of Alexandretta) was ceded to Turkey by France. As an example of the distance travelled by France away from the state of collective security, the disposal of the Republic of Hatay was a direct violation of the terms of the French mandate over Syria received in 1920 from the League of Nations. The countries of Poland, Rumania, Greece and Turkey were now in common agreement with England and France that further aggression should be resisted with force. A formidable non-aggression front had been created. In an effort to overcome strategic difficulties preventing the prompt realization of practical military aid, England undertook negotiations for a mutual assistance pact with the Soviet Union.

(3) *Allied Negotiations with Russia.*—Britain opened negotiations with the Soviet Union for a mutual assistance pact in April 1939. France already had a mutual assistance pact but not a military alliance which Russia had accepted in 1935. The first proposals made by England were considered unsatisfactory by Russia. It appears that England sought an agreement whereby Russia would aid Poland and Rumania, subject to Polish and Rumanian decisions on time and method; and further subject to the actual

rendition of French and British military aid to those countries. Russia refused this offer because it contained no guarantee of British and French assistance to the Soviet Union, and further no guarantee was made concerning the status of the Baltic states of Lithuania, Latvia and Estonia.

In May, negotiations were reopened when England offered a draft of a treaty of mutual assistance for consideration by France and Russia. This pact was to be subject to the terms of the League of Nations Covenant, and did not include any guarantees to the Baltic states. In the light of later events it is important to consider that Estonia, Latvia, Lithuania and Finland were reluctant to reject guarantees against Nazi aggression and also were reluctant to accept guarantees made by the Soviet Union. These states were interested primarily in maintaining neutrality.

Russia did not accept the second British offer, and new proposals were drafted in June for consideration by the Soviets. These new proposals were presented by William Strang, Eastern European expert of the British Foreign Office. In August, England and France sent a joint military mission to Moscow to discuss the extent of Russian aid available for use in Poland and Rumania. The conclusion of a Soviet-German pact on August 23 nullified all Allied efforts in this direction, and further negotiations were rendered impossible.

The British (and French) have justified their failure to conclude a pact with Russia on several grounds. It has been said that Poland refused to accept Russian military aid, that the Russian military aid would in fact prove to be a liability, that the Allies could not join Russia in domination of the Baltic states, and finally that Russia had no desire to help the Allies. It remains true that Russia is a totalitarian state, familiar with the rules of power politics, and concerned primarily with the welfare of the Soviet Union. England and France have equal concern for their individual welfare, but were pursuing the policy of defending the rights of small nations against the technique of "white war." Again, Russia had been excluded in the negotiations at Munich, and the Soviet statesmen suspected the sincerity of British and French proposals for either diplomatic or military agreements. The Allied negotiations with Russia proved to be a failure insofar as an attempt to extend the non-aggression front was concerned. The conclusion of a Soviet-German pact appears to have been the final action which prevented any agreement between the Allies and Russia. And this agreement further appears to be the first German victory in the diplomatic counter-offensive aimed against the Allied efforts for a non-aggression front.

(4) *The Soviet-German Pact.*—The Soviet-German non-aggres-

FRENCH TROOPS moving up to a position in captured German territory early in Oct. 1939



sion pact was concluded on Aug. 23, 1939. It appears that negotiations leading to the final acceptance of this agreement were begun in the early spring. The first indication in official documents appears in a report made on August 16 by Sir Nevile Henderson, British ambassador to Germany, of a conference held with Baron von Weizaecker, German secretary of State, who "seemed confident and professed to believe that Russian assistance to the Poles would not only be entirely negligible but that the U.S.S.R. would even, in the end, join in sharing in the Polish spoils." It is probable that the Soviet-German negotiations were under consideration at the same time that Allied proposals were being discussed in Moscow. A trade agreement between Russia and Germany had been signed on Aug. 19, 1939. By this agreement the Soviet Union contracted to supply Germany for two years with raw materials valued at 180,000,000 marks. Germany, in turn, promised to supply machines and manufactured goods valued at 200,000,000 marks.

On Aug. 24, 1939, provisions of the non-aggression pact were made public. The essential elements of the pact include: an agreement covering a period of 10 years, that each country will refrain from acts of aggression against the other, either alone or in combination with other nations; that they will consult regarding common interests; and that they will adjust by peaceful means any conflicts which might arise between them. Whether any other provisions of the pact exist is unknown.

The announcement of this agreement caused widespread confusion, particularly in Western Europe, and generally throughout the world. Conservatives had expected that Nazism was a defence and a bulwark against the spreading of Communism. Left-wing groups everywhere had believed that the U.S.S.R. would never withdraw its opposition to Nazism. The separate ideologies of these two totalitarian states had convinced the majority that the aims of each lay in opposite directions. For 20 years observers had claimed that sharp lines of distinction separated the party principles of the Nazi and the Communist. Since 1920, Adolf Hitler had informed his party followers that Communism was the enemy of the German State. In his book, *Mein Kampf*, he stated that an agreement between Russia and Germany would mean the end of his country. Since 1933 he had exhorted the German people to join in a crusade against the "criminals" of Moscow. Germans had fought in Spain against the Russians in a campaign to support Fascism and prevent the spread of Communism. Germany had concluded with Italy and Japan an anti-communist protocol. These, and many other factors, supported the view widely adopted that Germany and Russia would never make common cause or reach diplomatic agreement.

Disregarding the consideration of political philosophy, and speculative examinations of party ideologies, there were many practical reasons which led to the conclusion of the Soviet-German pact. In the first place, each was opposed to the policies of western democracy. Russia, in the early stages of industrial organization, required the technical experience available in Germany which could make full use of the vast supplies of man-power and raw material available in the Soviet Union. The developments of Russian raw materials might result in finding a large market in the highly industrialized German State. For the practical consideration of economic interdependence the two countries had a common interest. It has always been evident that officers of the German Army found it convenient to train in Russia when the Reichswehr was still under restrictions of the Treaty of Versailles. The disarmament provisions of that treaty long ago led to practical considerations for the construction of armament factories in Russia. Germany has always considered that in a major war security on the East flank would be essential to gain victory in the West. For both economic and military reasons, Germany and

Russia could find common agreement. In the light of the developments of the "white war" during the early months of 1939, it appears today that the Soviet leaders discounted any help which had been promised to them by France and Britain in the event of a German attack on Russia. It is possible that they considered the Red Army to be no match for the highly efficient German forces. A non-aggression pact with Germany would at least postpone any attack by Germany and divert German expansion away from Russia in the direction of the Western powers. The historians will speculate on the real basis for rapprochement between Germany and Russia. The similarity between their common opposition to the principles of democracy, the joint needs in the fields of economic and military security, are not alone the only support to be found for their agreement. Each held a deep resentment against the provisions of the Treaty of Versailles. Each had a common hostility to the British Empire which limits their individual aspirations in many parts of the world, and, if destroyed, would provide considerable profits for Germany and Russia.

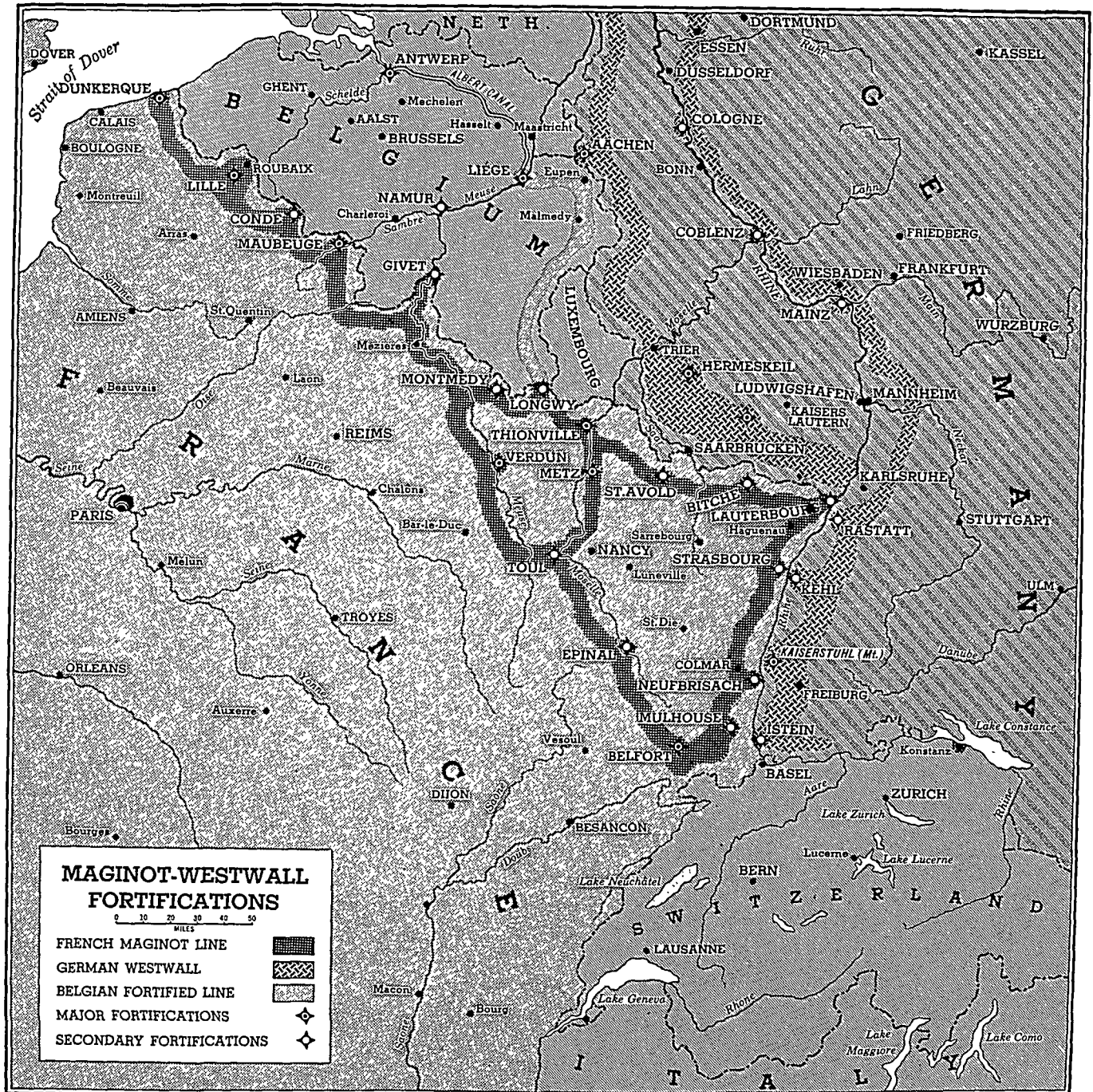
In the considerations which led to the opening of the combat phase of the European war of 1939, the conclusion of the Soviet-German non-aggression pact appears to have been the final diplomatic action which immediately preceded the conflict.

Summation.—The real causes of any war remain obscure during the combat phase, appear in bewildering dress immediately following the war, and provide endless speculation until the approach of the next war. Moral judgments appear suspended during conflict. Prompt and continuous examination of facts suggest that this suspension might not run the risk of becoming extinction. An examination of the preceding account indicates that the following were contributory causes to the 1939 European war:

- (1) The acceptance by England and France of German demands, based upon racialism and the theory of self-determination for German minorities. (The policy of appeasement.)
- (2) The drift away from the post-war system of collective security and the substitution of direct negotiation leading to agreements outside the provisions of post-war treaties. (The Munich Agreement.)
- (3) The development of a German policy of imperialism, based upon territorial expansion. (The march to Prague.)
- (4) The reversal of the policy of appeasement and the creation of a non-aggression front, coupled with rearmament.
- (5) The failure of non-aggression and the failure of the major powers to accept peaceful negotiation.

Germany.—Organization for National Defence.—The organization for national defence in Germany is controlled by a supreme command and co-ordinated by a defence officer. The Reichsfuehrer Adolf Hitler is the supreme commander of all armed forces (*Wehrmacht*) of the German nation. He has a principal assistant, Colonel General Keitel, for the supreme command, and exercises control through the separate commanders of the army (*Heer*), the navy (*Kriegsmarine*) and the air force (*Luftwaffe*). The defence office operates under the supreme commander and is responsible for co-ordination of all policies common to the three services. Industrial mobilization and counter-espionage are functions of this department.

The German State is divided into several territorial areas, each consisting of complete facilities for mobilization, replacement and general military administration. The organized units within territorial areas are assigned to one of the six army groups which cover the nation. The 1st Army group faces Poland (or Russia). The 2nd Army group faces Holland, Belgium, France and Switzerland. The 3rd Army group faces south towards the former provinces of Czecho-Slovakia. The 4th Army group faces north towards the seacoast. The 5th Army group is in Austria and faces Italy. The 6th Army group has no territorial assignment and exercises control of training for mechanized and anti-mechanized units. The National Defence Law of 1938 renders all male citizens liable for military services between the ages of 19 and 45 years. In war-time these provisions may be extended beyond the 45-year limit, and further, both men and women may be obligated for service other than military on order of the minister of war. In effect, all male and female citizens may be called for national service, military or otherwise, under this total mobilization plan.



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Army.—The following table is an estimate of the strength of the organized forces of the various components. These figures include Austrian and Sudeten reserves.

Regular Army (active)	1,000,000	Political Organizations (semi-military)	
Reserves (trained)	1,250,000	S.S. (Black Shirts)	100,000
Landwehrs (trained)	1,500,000	S.A. (Brown Shirts)	1,000,000
Reserves (partially trained)	2,500,000	Motor Corps	300,000
		Technical Emergency Help Corps	150,000
		Motor Service Corps	250,000
		TOTAL—Military and semi-military	8,050,000

In peace-time, the army consisted of from 55-65 divisions. In war-time this total might expand to 160 or more divisions of all types.

Navy.—The following is an estimate of the strength of the organized forces and total ships as of Sept. 1, 1939: Commissioned, 4,000; Enlisted, 60,000; total, 64,000. Adequate naval reserves are available as required for new units when placed in commission.

Ships (all categories including battleships, cruisers, destroyers, aircraft carriers and submarines, but excluding torpedo boats, escort vessels, tenders, mine sweepers and similar assorted small craft): in commission, 128, tonnage, 275,000; building, 65, tonnage, 240,000.

Air forces which operate with naval forces are part of the unified air force. There is no separate air arm under naval control.

Air Force.—The following table is an estimate of the strength of the organized forces and totals of aircraft in the various components as of Sept. 1, 1939:

Personnel		Active	Reserve	Total
Commissioned		6,000	5,000	11,000
Pilots		3,000	2,000	5,000
All others				
TOTAL		9,000	7,000	16,000
Flying Cadets		2,500		2,500
Enlisted				
Pilots		7,000	5,000	12,000
Mechanics		7,000	1,000	8,000
All others		150,000	40,000	190,000
Anti-aircraft				
Commissioned		6,000		6,000
Enlisted		120,000		120,000
Air Signal Troops				
Commissioned		1,500		1,500
Enlisted		30,000		30,000
TOTALS		333,000	53,000	386,000

Planes	Totals	Planes	Totals
Pursuit	2,700	Training	3,500
Fighter	600	Transport and Service	2,000
Bombardment	6,000		
Observation	2,000	TOTAL (including reserves) .	16,800

The air forces include approximately 370 active squadrons, and it is estimated that over 150 reserve squadrons are available. A squadron consists of 12 planes (9 active, 3 reserve), 5 commissioned pilots, 6 enlisted pilots and 100-130 enlisted men. Production rate on Sept. 1, 1939 in the aircraft industry was 1,500 planes per month.

Theory of Combat.—All armed forces in Germany are combined in pursuit of a policy of swift destruction of enemy opposition. The theory of combat for the army appears to be the hammer blow or lightning stroke involving a crushing attack launched with an intense effort designed to overcome all opposition. The naval forces, due to lack of numbers and geographical limitations, adopt the theory of air, surface and undersea attack against enemy naval and merchant craft. The air forces are modern and as yet remain an unknown factor insofar as a major air engagement is concerned.

It appears that the theory of combat for air would theoretically be the lightning blow delivered with maximum strength, with carefully selected objectives. Great attention has been paid, as the Polish campaign and the operations in the North sea testify, to the co-ordination of the work of air and surface forces, both by land and by sea.

Strategical Considerations.—Germany entered the war as an absolute dictatorship, vigorously pursuing a rigid nationalistic policy, seeking to obtain a commanding position militarily, economically and politically in control of Europe. Internally, all effective organized opposition to the Government had been suppressed. Freedom of political and diplomatic action had been gained by nullification of post-war treaty agreements. Concentrated efforts had resulted in approaching completion of a re-militarization program, including the creation of a formidable air force second to none. Economically, the nation had mobilized industry and labour on a war basis, subject to centralized Government control. This industrial mobilization equalled or excelled the expansion of the military program. Geographically, the nation's military position was strengthened by the acquisition of Austria and the reduction of the Czech salient. The defences in the west had been strengthened and extended from Switzerland to the Dutch border.

Defences in the east were less complicated but considered adequate.

The North sea and the Baltic approaches were considered protected by the fleet and the north coast was equipped with air and coastal defences.

Italy, Yugoslavia and Hungary were on friendly terms with Germany and with the Alps as a barrier, the southern borders appeared secure.

On land and sea and in the air Germany appeared strong and moving in the direction of greater strength. The political differences with other world powers and the unpredictability of the course of the absolute ruler, Adolf Hitler, made the national strategy a question of opportunism. Few predicted that a Soviet-German non-aggression pact would immediately precede the campaign in Poland.

Few believed that the lightning military success in Poland would follow immediately. Few anticipated the overtures of peace to England and France.

The basic consideration at the close of 1939 appeared to be that for Germany the strategy of opportunism dictated the future conduct of national events.

Great Britain.—*Organization for National Defence.*—The supreme command of all armed forces is vested in the King-Emperor. The military forces consist of the army, the Royal Navy and the Royal Air Force. Each of these organizations is di-

rected by an independent ministry and these three ministries are co-ordinated through the committee of imperial defence.

The war office (army), the air ministry (Royal Air Force), the admiralty (Royal Navy), are represented by their respective ministers and, with the minister for co-ordination of defence, join the prime minister, the chancellor of the exchequer and other cabinet officials in the deliberations of the committee of imperial defence, in which are also included the chiefs of staff of the three fighting services.

The defence of the self-governing Dominions is a Dominion responsibility. That of India is, at least in part, controlled by the Indian Government, in co-operation with the war office, air ministry, etc.

The colonial office controls certain armed forces in the colonies (e.g., King's African Rifles, Royal West African Frontier Force, etc.).

The ministers for the Dominions, the colonies and for India are included in the committee of imperial defence.

Army:	Active	Reserve	Total
Regular Army			
Commissioned	12,700	34,500	47,200
Enlisted	195,000	350,000	545,000
	207,700	384,500	592,200

These figures include British Army in India and the Colonial and Indian troops. Includes men of legal age and in categories as shown. It is estimated that additional manpower can be secured as follows: trained, 150,000; untrained, 4,000,000; a total of 4,742,200.

Navy:	Active	Reserve	Total
Personnel			
Commissioned	11,400	4,800	16,200
Enlisted	130,000	54,000	184,000
	141,400	58,800	200,200

Ships: commissioned, 312, tonnage, 1,225,000; building, 90, tonnage, 700,000. The naval air arm includes 10 squadrons at home bases, and 15 squadrons at overseas bases, a total of 25 squadrons or 375 ships.

Air Forces:	Active	Reserve	Total
Personnel (Excluding India)			
Commissioned	6,300	2,200	8,500
Enlisted	66,000	13,500	79,500
	72,300	15,700	88,000
Air Force in India			
Commissioned	300		300
Enlisted	2,000		2,000
	74,600	15,700	90,300

Planes: (fleet air are not indicated) (Sept. 1, 1939): bombers, 1,867; fighters, 1,101; observation, 574; training, 400; transport and service, 75; a total of 4,017. Production rate peace-time monthly basis: (Sept. 1, 1939) 600; (Dec. 31, 1939) 1,000. The air force includes approximately 210 active squadrons of which 50 are based in possessions.


Theory of Combat.—The theory of combat for all armed forces is determined by the following considerations:

- Defence of colonies and the empire.
- Defence of the United Kingdom in the event of major conflict in western Europe.

All forces are united in the theory of an initial defence against attack, followed by repeated counter-attacks which may result in independent air, ground or naval engagement, or may be the result of joint operations. The navy has always hitherto been the initial force engaged in a major conflict. The army has usually been a small force operating independently in colonies and other parts of the empire, or a large force engaged in one theatre of operations on the continent.

The air force, like that of other major powers, was not tried in a major air engagement.

It appears that the theory at present in effect would be the use of a small ground force joined with allies in an initial defence on the ground, followed by counter-attacks, the result of joint land, air and naval action; while placing great dependence on the effect of sea control and blockade.



Strategical Considerations.—The position of the United Kingdom in relation to western Europe where the nation is open to invasion from the water and aerial attack from Europe, has resulted in the adoption by Britain of a large navy to protect shipping and to permit uninterrupted control of the sea lines approaching the home territory. Further, the historic necessity for military intervention on the Continent has required the adoption of a small, efficient, expeditionary force available for use in western Europe. Politically, Britain has commitments in all parts of the globe and conversely has obligations which require close attention to major political developments throughout the world. As a great commercial nation, with traditional political associations with the major powers and geographically with nearly all world areas, Britain is faced with the necessity of maintaining large defence forces or the provisions for rapidly securing such forces. Britain seeks to maintain peace as means of the maintenance of the order—and the trade by which she lives. It is imperative that France and Belgium, adjacent to Britain in western Europe, be protected from danger and be retained as partners in the promotion of peace.

These considerations have led Britain to the adoption of a policy of international agreement as a means to the solution of major political and economic differences.

France.—System of National Defence.—The armed forces of the nation consist of the army, the navy, the air army and the gendarmerie or national police force. Constitutionally the president of the republic is the supreme commander of all armed forces. Actual control and administration are exercised by respective ministers of the various departments.

On Jan. 21, 1938, Premier Edouard Daladier, minister of national defence and war, extended his powers over the minister of interior (police), minister of air and minister of marine (navy). The chief of the general staff of national defence is the principal adviser to the minister of national defence. General Maurice Gamelin was appointed to that position and still retained (Jan. 1, 1940) his duties as chief of the general staff of the army. The supreme council of national defence which includes a general secretariat under the orders of the minister of national defence and war; the permanent committee of national defence and the army general staff, all consist of representatives of all armed services and of the ministers of the Government, and are charged with making studies and recommendations on important questions affecting national defence. The Premier of France controls and co-ordinates national defence measures while the chief of the general staff of national defence (General Maurice Gamelin) co-ordinates mobilization and war plans for the ground and air forces.

In Sept. 1939 the French and British Governments announced an agreement for co-ordinated control by Gamelin of the French and British armies, also plans for joint air forces and for combined naval forces.

The War Department of France consists of the following agencies for military control and administration: the superior war council, the general staff of the army, the central administration, the directorates, the inspectorates-general, the geographical department.

A number of other agencies are charged with the administration of transport, including railways, roads; ammunition supplies, including explosives and arms; industrial mobilization, including labour; and an advisory committee on colonial defence.

PHOTOGRAPH taken from a German bomber during raid on the Firth of Forth Oct. 16, 1939. The British cruiser "Southampton," at the top, has just been partially hit by a bomb, while misses are recorded by the foaming water at the upper left, and the dark churning water beside the cruiser "Edinburgh" at the bottom

The superior war council consists of the minister of war (president), the chief of the general staff (vice-president), the marshals of France and 12 generals. Its chief function is to study and advise on all matters affecting preparation for war and organization of the army. Instruction and training of troops, concentration and mobilization plans and the organization of fortress defences are important subjects within the considerations for this council. The general staff of the army consists of the chief of the general staff of the army and two principal assistants. The first assistant is the chief of staff of the armies in the field, and is directly responsible to his chief for all matters pertaining to duties of the commander-in-chief of the armies in the field. The second assistant is chief of staff of the army, and is directly responsible to his chief for the conduct of the affairs of the general staff of the army at the war department headquarters. The balance of the general staff of the army includes a secretariat, four principal bureaus for personnel, intelligence operations and supply, a technical research bureau, and four sections in charge of affairs for general administration, codes, overseas forces and historical research.

The inspectorates-general function as senior inspectors for all troops, training and military works, in time of peace. In times of war the responsibility for these activities passes to the individual unit or organization commander.

Army.—The following table is an estimate of the strength of the organized forces in the various components:

	France	Morocco	Algeria	Near East	Colonies	Total
Regular Army (active)	465,000	70,000	100,000	14,000	65,000	714,000
Gendarmerie (Garde Mobile)	47,000			300		47,300
Garde Republicaine (de Paris)	3,000					3,000
	515,000	70,000	100,000	14,300	65,000	764,300
Reserves (French)						4,000,000
Reserves (Native)						500,000
Peace-time number of divisions—32-41						5,264,300
War-time number of divisions—120-150						
Including reserves in France beyond legal age, and adding untrained or partially trained natives from North Africa, France could add another 2,000,000 men						2,000,000
TOTAL MANPOWER						7,264,300

Navy.—The following is an estimate of the strength of the organized forces and total ships as of Sept. 1, 1939: *Personnel* (active): commissioned, 5,650; enlisted, 92,000; a total of 97,650. *Personnel* (reserve): commissioned, 5,000; enlisted (fully trained), 150,000; enlisted (partially trained), 350,000; making a total of 505,000. *Ships* (all categories including battleships, cruisers, destroyers, aircraft carriers and submarines, but excluding torpedo boats, escort vessels, tenders, mine sweepers and similar assorted small craft): in commission, 173; tonnage, 815,000; building, 61; tonnage, 210,000. Naval aviation is an integral part of the naval forces. The *personnel* includes: commissioned, 450; enlisted, 3,500; enlisted reserve, 6,000; making a total of 9,950. *Planes*: pursuit, 30; observation, 50; patrol, 25; training and others, 70; a total of 175.

Air Forces.—The following table is an estimate of the strength of the organized forces and totals of aircraft in the various components as of Sept. 1, 1939:

	Personnel	Active	Reserve	Total
<i>Commissioned</i>				
Pilots		2,500	5,000	7,500
All others		1,300	4,500	5,800
<i>Enlisted</i>				
Pilots		2,400	5,000	7,400
All others		44,000	150,000	194,000
TOTALS		50,200	164,500	214,700

Planes: pursuit, 1,100; observation, 330; bombardment, 1,250; training, 500; transport and service, 25; a total of 3,205 (many of these obsolete). Plane production rate (Sept. 1, 1939) was 250 (monthly).

Theory of Combat. The theory of combat for all arms in France is an initial defence followed by co-ordinated land and air attack, combined with naval blockade of enemy coastal positions. The land forces of France represent a large, well organized, well led, modern force, with modern equipment, in position behind well defended frontiers. The air forces appear to be less modern than potential opponents, but combined with potential allies able

to engage in major aerial combat.

The naval forces are able to patrol colonial and other possessions of the French empire and appear to adopt the theory of defence for essential communications (notably those with north and west Africa) combined with limited attack when odds offer favourable advantage.

Strategical Considerations.—The geographical position of the country permits the adoption of defence on nearly every frontier. The completion of artificial barriers has made the natural obstacles useful in this system of defence. It appears unlikely that any enemy naval attack could be launched against the mainland, and without the reduction of France as a political area, the African empire and other positions could be defended. Politically, the nation has adopted the policy of seeking world peace as a basis for retaining national security. Present weaknesses in securing adequate manpower and political commitments in western Europe and other parts of the world place France primarily on the defensive.

Alliance with Britain and a policy of joint defence with Belgium are considerations accepted by necessity, with a view of securing joint forces to maintain a joint peace.

Poland.—*Organization for National Defence.*—The supreme command of all military forces was vested in the commander-in-chief, the president of the republic. A committee of state defence included the president of the republic, the president of the council of ministers, the minister of military affairs and other officials of the Government. The administration of the army and the navy was co-ordinated under a ministry of national defence, charged with the duties of co-ordinating all activities looking to the maintenance of adequate armed forces for the defence of the country.

	Active	Reserve	Total
<i>Army:</i>			
<i>Personnel</i>			
Commissioned	19,000	50,000	69,000
Enlisted	320,000	1,000,000	1,320,000
	339,000	1,050,000	1,389,000

Additional manpower estimated at about 2,000,000 or a total manpower of about 3,500,000. The peace-time division strength was 35; war-time division strength, 70.

The following is an estimate of the strength of the various components as of Sept. 1, 1939: regular army (active), 360,000; reserves (trained), 300,000; reserves (partially trained), 1,200,000; service military forces (frontier guards, state police, customs service), 65,000; a total of 1,925,000.

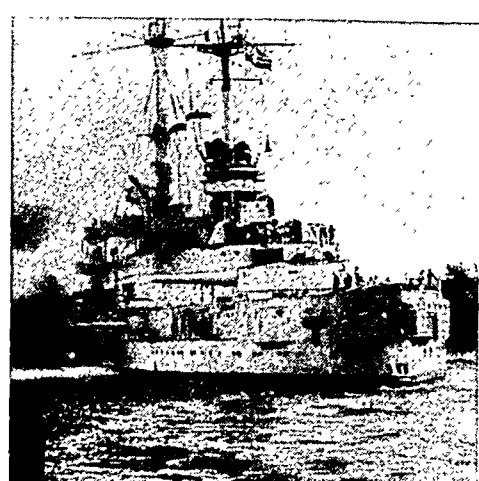
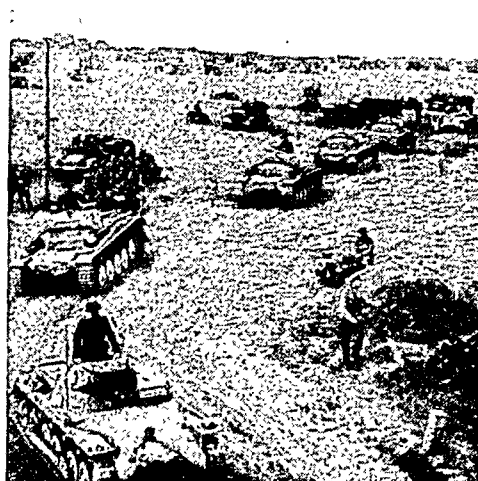
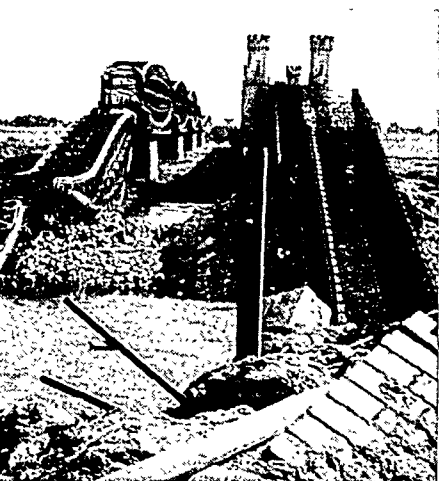
Poland could organize 30-35 divisions in peace-time and with ample time in a prolonged conflict might raise and equip another 20-30 divisions. The bulk of reserves would be used as replacements and the estimated additional manpower available was 2,000,000, or an assumed effective manpower of close to 4,000,000.

Navy.—*Personnel*: commissioned, 500; enlisted, 5,600; a total of 6,100. *Ships*: commissioned, 5, tonnage 6,000; building, 2, tonnage 3,000. About 25 small craft, including 10 river monitors and river gunboats, as well as a number of motor boats made up the small navy.

	Active	Reserve	Total
<i>Air Forces:</i>			
<i>Personnel</i>			
Commissioned	800	220	1,020
Enlisted	4,500	500	5,000
	5,300	720	6,020

Planes: bombers, 465; fighters, 110; observation, 80; training, 90; transport and service, 55; a total of 800. Peace-time squadrons approximately 40 to 45; war-time squadrons approximately 60. Plane production rate (Sept. 1939) 30 (monthly); (Dec. 31, 1939) none.

Theory of Combat.—No definite theory of combat is offered in an analysis of Poland. The alliance with France appears to have established a similar theory of international defence, followed by counter-attack when opportunity offered. The limitations in numbers and in equipment, as well as considerations of potential opposition, resulted in the adoption of defence as of paramount importance in combat.



INCIDENTS IN THE CONQUEST OF POLAND. *Left:* Bridges across the Vistula at Tczew in the Corridor blown up by retreating Poles early in Sept. 1939 to delay the German advance. *Centre:* Nazi medium tanks rolling out to an attack

"somewhere in Poland." *Right:* The first shot of the war was fired by the German training ship "Schleswig-Holstein" at Westerplatte peninsula in Danzig harbour early in the morning of Sept. 1, 1939

Strategic Considerations.—Geographically Poland had no natural frontiers which offered any considerable security against invasion. A limited coast line was open to attack by more powerful naval forces on either side. In the west, no natural obstacles and limited artificial barriers existed against armed attack. In the east, the frontier was divided by extensive marshlands but offered easy avenues of approach north and south of the marshland area. Politically, changes had resulted in the loss of favourable natural frontier obstacles in the south and southwest; the nation was committed to continuous efforts to secure favourable alliances with other and more important European powers. Internally, inadequate economic system resulted in poor lines of communication and inadequate sources of procurement and maintenance of war materials. The entire central area of the nation appeared to be a potential manoeuvre ground in the event of conflict between Germany and Russia, or a probable area of expansion in the event of German and Russian alliance.

Russia.—*Organization for National Defence.*—The Union of Soviet Socialist Republics is organized with a supreme council or Soviet, which exercises supreme control of the Government of the separate Soviet Socialist Republics. This supreme council delegates most of its authority for control of the military forces to the People's Commissariat for Defence. This commissariat is in reality a department of national defence and is headed by a commissar. The commissar for defence controls a military council which consists of political commissars for all territorial districts, who, in company with the military commanders, exercise the administration of the armed forces. Military orders are required to be the unanimous decision of the military commander, the political commissar and the chief of staff or superior commander of the particular organization involved. As a matter of administration, the supreme council or Soviet of the Republics operates with a similar body known as praesidium, consisting of 37 members, charged with control of appointments, removals and mobilization orders for the military forces of the nation.

Army.—Regular army: active, 660,000; reserve, 380,000; total, 1,040,000.

Mobilization of territorial or reserve organizations (partially trained) could result in an additional strength of 1,300,000 men. Accepting limitations requiring adequate equipment for available manpower, it is estimated that Russia could place 100 to 110 divisions (of all types) in the field on opening of hostilities and 50 to 60 additional divisions in the field within three months of mobilization. However, only 25–30 of this total can be described as first-line divisions. The forces are widely scattered, including European Russia, the Caucasus, central Asia, Siberia, and the Far East.

The Navy.—Estimate of Russian naval strength is subject to the limitations imposed by secrecy and censorship.

Personnel: Commissioned, 5,000; enlisted, 68,000; total, 73,000.

Naval reserves are considered adequate for surface craft commissioned after mobilization, but considered inadequate for undersea craft.

Ships: In commission, 239; tonnage, 228,000; building, 200 (mostly undersea craft); tonnage not estimated. Co-operative air squadrons are known to operate with the air force, numbers and strength unknown.

The Air Force.—*Personnel:* pilots, active, 8,500; reserve, unknown; total 8,500. All others, active, 55,000; reserve, unknown; total, 55,000; grand total, active, 63,500. *Planes:* Bombardment, 1,500; observation, 1,200; fighter, 3,000; transport and service, 2,000; total, 7,700 (including reserves). Of these, about 3,500 are first-line.

The estimates on personnel do not include semi-military organizations and extensive civilian organizations which include large numbers of partially trained pilots and mechanics. The estimates on planes do not include production capacities for large bombardment aviation. Reserves in the air force are considered adequate in personnel for replacements up to 50% of anticipated losses. Reserves for ships are considered adequate in numbers but inadequate in efficiency for replacement up to include 25% of anticipated losses in combat.

Theory of Combat.—The theory of combat of all arms of the Russian forces includes the adoption of modern technique involving the use of mechanized forces in conjunction with large scale ground movements in original attack on weaker States or delayed defence against equal or superior opposition. Within the several services the offensive is emphasized and the theory of carrying the combat to enemy soil is laid down as a cardinal principle. Whenever defence is employed, the adoption of an active defence including the use of mechanized forces for sharp counter-attack within the defence zone, is accepted as a modern part of the general theory of combat. Russian forces appear to include in any general theory of combat favourable consideration for the use of propaganda and widespread expansion of subversive activities as component parts of an active offensive against an opponent.

Strategic Considerations.—The political policy of the U.S.S.R. was publicly announced during the period 1920–30 as a policy emphasizing the stimulation of world revolution. The more recent public announcements of the policy of the predominant political party have emphasized the maintenance of world peace. Geographically, the nation faced potential enemies on two frontiers until after September 1939, when the pacts were completed with Germany and Japan. It appears that the basic policy of the military forces included defence of the frontiers and rejected excursions into the field of military conflict outside the national borders. The acquisition of Finland, the Baltic States and eastern Poland, as well as the recovery of Bessarabia in the south-west are considerations which lead to the conclusion that the strategy of opportunism affords Russia more incentive for engaging in wars of conquest. The Sino-Japanese conflict in the Far East and the preservation of rich, natural resources in south



GERMANY'S MOTORIZED COLUMNS advanced on time-table schedules as Poland collapsed in Sept. 1939. *Left:* German motorcycle scouts pass rapidly through a town near Bydgoszcz. *Centre:* The scouts abandon their motorcycles and rush

to meet a Polish attack. *Right:* Pioneers (engineers) of the German army carry a section to repair a bridge; the efficiency and speed of their work was an important factor in the army's rapid advance

and central Asia indicate the maintenance of an international defence policy in these areas. Subject to the opinions and decisions of a closely-knit political organization, dominated by a single individual, the actual operations of the military forces of the nation become unpredictable. The best estimate seems to indicate that Russia has practically inexhaustible resources in men and material and could afford to accept or reject opportunities for conquest or adopt delaying defenses against opponents with equal impunity over the short period of time. In the long view the stability of the political system and the maintenance of an internal economy and system of transport which guarantees food, shelter and clothing for the majority of the Russians, would determine the final result of any policy adopted.

Finland.—Organization for National Defence.—All armed forces of the nation are under the command of the president of the republic under the constitution of the State. The administration of the armed forces is controlled by a minister of defence, an army commander and a commander of the civic guard. The conduct of military operations is administered by a general staff, including departments of personnel, intelligence, operations and supply and inspectorate. (See *Finnish Armed Forces*, page 266.)

German Campaign in Poland.—Germany.—In Aug. 1939 the German Army had an estimated strength of 90 infantry divisions, each consisting of approximately 14,000 men; 6 mechanized divisions, each composed of approximately 11,000 men; 3 light mechanized divisions, 1 horse cavalry division, 2 or 3 mountain divisions and a reserve of Landwehr (fortress troops) estimated at 20 divisions. Exclusive of fortress troops, Germany could mobilize slightly more than 100 divisions of all types, fully equipped with modern weapons and adequately organized for a campaign in Poland. It must be remembered that the tense situation in August included mobilization on a large scale and that these estimates allow for pre-war rather than peace-time totals. The total manpower of these forces is estimated at close to 1,350,000 men.

The forces for the campaign were divided into two army groups under the high command of Colonel-General Walther von Brauchitsch. The southern group was commanded by Colonel-General Karl Rudolf Gerd von Rundstedt, with Lieutenant-General Mausein as chief of staff. The right wing or south army of this group was commanded by General List. The centre army of this group was commanded by Artillery General Hans von Reichenau. The left wing or north army of this group was commanded by Infantry General Johannes Blaskowitz. The northern group was commanded by Colonel-General Fedor von Bock, with Lieutenant-

General Salmuth as chief of staff. The Pomeranian Army of this group was commanded by Artillery General Guenther von Kluge. The East Prussian Army of this group was commanded by General von Keuchler. The centre between the two groups was held lightly by frontier detachments. See map: Sketch No. 1, p. 258 (Dispositions of German-Polish forces on Aug. 31, 1939).

In the air forces, Germany had organized 4 air fleets, each responsible for a territorial area of Germany. Air fleet No. 1 centred around Berlin and faced Poland. Air fleet No. 2 covered the northwest and faced the Netherlands, Belgium and England. Air fleet No. 3 in the west and south pointed toward France and Switzerland. Air fleet No. 4, recently organized in former Austrian and Czech territory, faced to the southeast. Two special air commands existed in addition to the air fleet organization. One was centred in East Prussia, the other in the industrial area between the Rhine and the Weser. Marshal Goering was commander-in-chief of the air force, with Major General Jeschonnek as chief of staff.

Air fleet No. 1 was commanded by General Kisserling. Air fleet No. 4 was commanded by General Loehr. These two air fleets conducted the bulk of the air operations in the German-Polish campaign. Each air fleet was estimated in Aug. 1939, to have consisted of about 1,700–1,800 combat planes, including 1,200–1,500 (approximately $\frac{2}{3}$) bombers. The East Prussian air command was expected to reach a total of 800 planes and the industrial area air command in the west was estimated to have the same number. The grand total of planes for the four air fleets and the two air commands was expected to reach a minimum of 8,400 first-line planes. A composite estimate places the actual number of first-line craft available in August at a maximum of 6,500. Reserves for the Polish campaign were considered adequate up to 100% replacement of all anticipated losses. On the sea, Germany was invincible in comparison with the Polish naval strength. The small seacoast and the proximity to German bases afforded Germany a predominant advantage for the projected campaign.

Poland.—In Aug. 1939 the Polish Army consisted of 30 infantry divisions; 1 cavalry division and 11 independent cavalry brigades; 12 regiments of heavy artillery for corps and army use, and a partially organized mechanized division which more closely approximated 2 independent and poorly equipped mechanized brigades. The reserve strength was estimated at a maximum of 30 divisions. The Polish Army was weak in heavy artillery, anti-tank and anti-mechanized guns, and there were severe shortages in anti-aircraft guns and in air defence organization. Poland placed a maximum of 500,000 men in the field during the early stages

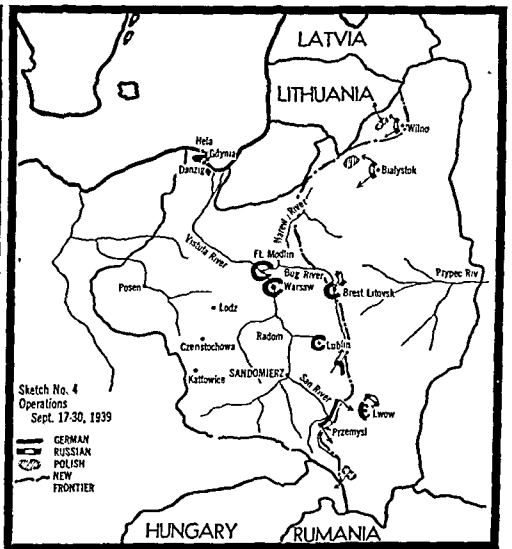
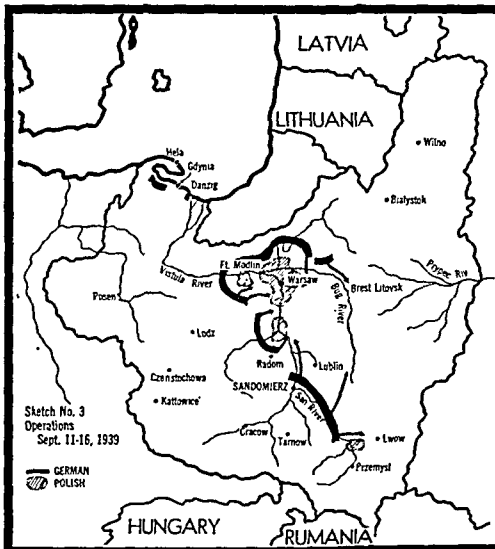
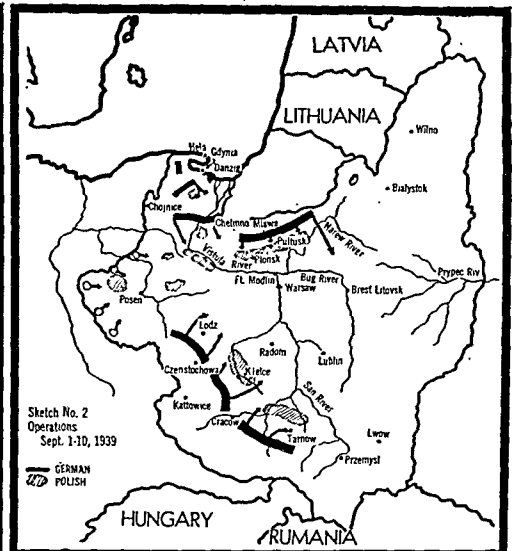
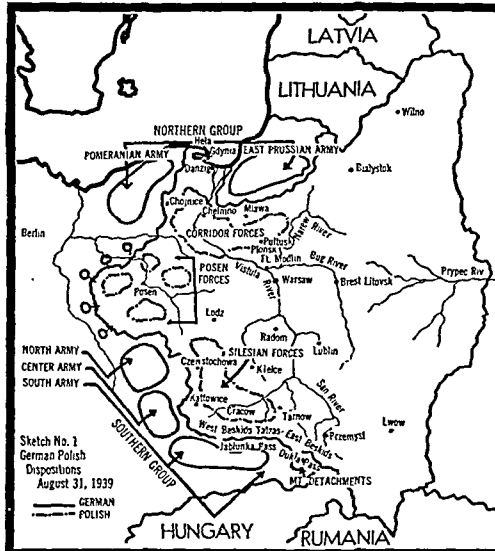
of the campaign. The Polish Army was under the command of Marshal Edward Smigly-Rydz. Under his command the Polish Army was divided into three main groups as follows: the Corridor army, along the Vistula river, south and south-east of Thorn, under the command of General Bortnowski; the centre army, in the area Lodz-Piotrkow-Kielce, under the command of General Kutrzeba and General Rommel; and the southern army, on the Nida river, centring on Cracow, under the command of General Sosnkowski.

In addition to these main groups there were subordinate concentrations in the east along the Narew river, north of Warsaw near Pultusk; and in the south along the border near Tarnow and Jaroslaw. Scattered Polish cavalry defence units, supported by reserve infantry, occupied delaying positions along the East Prussian frontier around Ciechanow, north of Warsaw; on the western border of the Corridor, west of Posen, south of Kalisz, along the Polish-Silesian border, and through the mountain frontier passes along the Slovak border. See map: Sketch No. 1 (dispositions of German-Polish forces on Aug 31, 1939).

In the air forces, Poland had organized two aviation groups of six regiments comprising an estimated total of approximately 900-1,000 planes. No more than 25% were bombers. Reserves were considered inadequate for replacements of more than 10% of anticipated losses. The Polish Navy was far inferior compared to the German naval strength.

The Scheme of Manoeuvre: German.—The primary goal of the German Army was the destruction of the Polish Army. The secondary goal was to destroy that force so swiftly that Poland would be eliminated as a military factor in Eastern Europe before Allied pressure in the west became dangerous. This scheme was decided upon after examination of political, economic and military factors, which led the German High Command to the following conclusions:

- (1) Poland would fight.
- (2) Poland over-rated her ability to prolong the campaign.
- (3) Poland under-rated the strength of the German Army and air force.
- (4) Poland counted on strong Allied pressure along the German west front at an early date.
- (5) Poland would attempt to occupy Danzig, attack East Prussia, delay in the Posen area, and fall back slowly along the Vistula, defend the southern frontier, and launch vigorous and frequent horse cavalry attacks against the flanks of the northern and southern German Army corps.
- (6) England and France might support Poland by declaring war, but would be unable to join Poland on the battlefield.
- (7) France could not mobilize and launch a serious attack on the ground in the west before at least 15 days. This attack would not be launched without tangible evidence of British participation which would delay the



opening date at least another 15 days, a postponement to 30 days after the opening date of the German campaign in Poland.

(8) No independent or joint French or British air attacks would be launched against Germany for fear of reprisals against Allied mobilization targets.

(9) The only risk involved was unexpectedly prolonged Polish resistance and the high command of the German Army provided a scheme of manoeuvre considered capable of overcoming this danger.

The German Army scheme of manoeuvre was a simple double envelopment, including a powerful drive from southwest toward Warsaw, and a second from Pomerania and East Prussia (in the north and northwest) toward Warsaw.

The southern group, consisting of three armies, had the mission of moving northeast with the main effort made by the centre army. The south army (right wing) was to protect the southern flank, force the Jablunka pass, and move to the east toward the San river valley. The north army (left wing) was to protect the north flank and assist the centre army in the capture of Warsaw.

The northern group, consisting of two armies, was to move to the southwest upon Warsaw. The East Prussian Army (on the left flank) was to cross the Narew and Bug rivers and join the centre army of the southern group. The Pomeranian Army (on the right flank) was to drive across the Corridor, join the East Prussian Army, and advance toward Warsaw to join the north army (left wing) of the southern group.

This basic scheme of manoeuvre included at least six separate and subordinate manoeuvres which contributed to the general plan.

These manoeuvres were as follows:

In the southern group:

(1) The southern army (right wing) to advance across the Carpathian mountains to the Tarnow railroad.

(2) The centre army to envelop the industrial district in Silesia and capture Cracow.

(3) The northern army (left wing) to drive past Lodz and advance to Warsaw.

In the northern group:

(4) Simultaneous invasions of the Corridor from the north and from the east by the Pomeranian Army (right flank) and by the East Prussian Army (left flank).

(5) A drive from southern East Prussia by the East Prussian Army (left wing) to the Narew river via Mława and Przasnysz.

In Danzig:

(6) The defence of the city, by organized defence corps volunteers, charged with the capture of municipal buildings (post offices, etc.), rail and water facilities, power and light outlets and communications (radio and telephone).

The goal of the German Navy was the destruction of the Polish naval forces, the capture of Polish naval bases, and the rapid establishment of German control over the Polish coast line. The naval scheme of manoeuvre included:

(1) Capture and destruction of Polish naval forces.

(2) Close the bay of Danzig.

(3) Bombardment of Gdynia-Hela and Westerplatte.

(4) Construction of mine barriers and expansion of German seacoast patrols.

The goal of the German air forces was twofold:

(1) The destruction of the Polish air force, and

(2) The destruction of Polish communications (highways, railroads, etc.) essential to mobilization.

Subordinate missions included the support of mechanized and motorized attacks, the systematic bombing of naval bases, naval craft, ammunition and other supply bases and industrial centres.

Air fleet No. 1 and air fleet No. 4, augmented by reinforcements from the remaining two air fleets, were constituted with an estimated strength representing approximately 85% to 90% of all available first-line combat planes.

Summation of German Plan.—The German high command co-ordinated political, economic, and military estimates of both the Eastern and Western fronts; and made analysis of the plans open to Poland; carefully evaluated the time factor, assigned specific missions to the ground, air, and naval forces; adopted a simple scheme of manoeuvre; and concentrated force behind the main effort.

The Scheme of Manoeuvre: Polish.—The goal of the Polish Army appears to have been based upon the following considerations:

(1) A general defence of the Western border, with minimum force.

(2) The gradual evacuation of frontier areas, keeping the bulk of the army intact for position defence and counter-attack.

(3) The delivery of sharp, sudden counter-attacks, mainly by independent cavalry units against exposed flanks.

(4) A final position defence around Warsaw, based upon the Vistula-Narew, Bug, and San river valleys; supported by reserves drawn from the east, and by Allied pressure against Germany in the west along the Rhine and in the north by naval blockade.

The Polish air forces had the mission of attack against enemy aircraft, distant observation of enemy ground forces and continuous bombing of enemy communications and troop concentrations.

The Polish navy followed no plan looking for engagement with the German fleet. If preparations for escape may be classified as long range defence measures for the future, then the Polish naval command may be credited with the adoption of some naval defence measures in the Baltic. Coastal defences, including garrison forces at Westerplatte, were prepared to resist landing parties. No extensive preparations, including mines, or long range coast defence guns, appear to have existed.

Summation of the Polish Plan.—The Polish high command, well aware of the general nature of the German plan and dispositions, and realizing that the impossibility of early Allied aid prevented adoption of a strong offensive action, determined upon a general delaying defensive over a wide front followed by gradual retirement to interior defensive positions. Two important considerations appear to have been neglected by the Polish leaders:

(1) The strength and extent of German air force activities, and

(2) The extent of German mobilization prior to Sept. 1, 1939.

The Opening of Hostilities.—At 5:45 A.M. Sept. 1, 1939, Germany launched the first organized offensive across the Polish frontier.

Northern Group: September 1-7.—The Pomeranian Army

(right wing) under General von Kluge, crossed the Polish frontier at Chojnice and advanced in the direction of Chelmno and the Vistula river. The German troops reached the Netze river and approached the banks of the Brahe, where determined Polish resistance was encountered. On September 3, the Brahe was crossed and East Prussian detachments approached Graudenz and attempted a junction with the right flank forces in preparation for a crossing of the Vistula. Polish forces, under General Bortnowski, were holding positions along the Vistula between Graudenz and Blomberg. Resistance in the vicinity of Graudenz was offered in an attempt to prevent envelopment of the Polish right wing by the swiftly moving columns of the East Prussian detachments. On September 5, the Polish forces retired under the heavy German pressure, and the Pomeranian Army crossed the Vistula near Graudenz and at Chelmno. (See map: Sketch No. 2, p. 258.)

In the meanwhile the East Prussian detachments captured Graudenz and the junction of the two forces was effected on September 7. General Bortnowski withdrew south of the Vistula in the direction of Warsaw and his forces began to receive large numbers of Polish troops retreating from the province of Posen. German frontier troops in the west began a systematic advance through open approaches in the Posen province, and rapidly closed in on Polish forces retreating to the east in the direction of Warsaw.

On the left flank of the northern group, the East Prussian Army, under General von Keuchler, advanced on September 1, across the Polish frontier, overcoming early resistance. This army eventually came to a halt before strong Polish forces between Pultusk on the Narew river and Plonsk on the Saldau river. Polish forces in the area between Mława and Lomza, under General Przeczmirski, had accomplished the difficult task of bringing the German Army attack to an abrupt, if temporary, halt. It is estimated that these Polish forces were only partially organized and included large numbers of reserves. Like other Polish troop concentrations, this group suffered severely from shortages of adequate artillery and other essential equipment.

Along the coastline, German detachments, assisted by naval vessels, had opened an attack on Gdynia and were engaged in the reduction of Polish coastal defences.

During the first week of the campaign, the Pomeranian Army and the East Prussian Army of the northern group, operating as three independent units (including East Prussian detachments of the right wing) had succeeded in penetrating the Corridor and isolating Danzig, the seacoast, and the mouth of the Vistula; had pushed large Polish forces south and east along the Vistula, and directly south from the East Prussian frontier in the direction of the outer defences of Warsaw. It appears that General Bortnowski made a serious error by delaying his movement to the south and east. Prompt retirement with the bulk of his force to the vicinity of Warsaw would have afforded him the opportunity to dig in and prepare a determined defence, with the majority of his troops intact. His stubborn resistance and deliberate retirement resulted in heavy casualties and the loss of valuable time needed for the preparation of a proper position of defence.

Southern Group: September 1-7.—The southern group, under General von Runstedt, crossed the Polish frontier on Sept. 1, 1939. The south army (right wing) under General List, forced the Jablunka pass, in the West Beskids, and on September 2 arrived in the vicinity of Teschen. The centre army, under General von Reichenau, crossed the lower branches of the Prosna river and the valley of Wartche, captured the city of Czeszochowa and pushed on rapidly in the direction of Radom. On September 5, the city of Kattowitz, on the left flank of the southern army, fell before the German advance. Within 24 hours, the principal southern city, Cracow, was open to attack from three sides, and on September 6 the German forces occupied the town. Mechanized units of the

centre army advanced far ahead of the ground units. Disregarding the traditional rigid requirements of continuous lines of communication to front and rear and constant liaison with adjacent elements, and dispensing with considerations for flank protection, these mechanized forces operated independently, far ahead of the main elements of raiding missions, accomplished their purpose with amazing speed. Elements of the swiftly moving mechanized troops, were reported at Kielce on September 5, at Piotrkow on September 6, and north and west of Lodz on September 7.

The north army (left wing) under General Blaskowitz, had advanced abreast of the centre army and rendered assistance in the reduction of the primary objective for the southern army group, namely the destruction of the main Polish forces and the capture of the industrial area centred around Cracow. Not later than September 3, General Blaskowitz began to accelerate the movement of his forces in the direction of Lodz and the main effort of the southern half of the double envelopment began to be developed. By September 7, the north army (left wing) had centred its main effort in the direction of Sieradz-Lodz-Warsaw, with advance elements far to the north operating against retreating Polish forces from Posen and against elements of the left flank of the retreating Corridor army as it moved to the east and the south along the Vistula. Mountain troops from positions east of the right wing of the southern group, and operating independently, crossed the East Beskids pass and captured Nowy Sacz, driving scattered Polish forces back towards Tarnow.

During the first week of operations, the three armies of the southern group had penetrated the Polish resistance, captured the important industrial areas in the south, disorganized the elements of Polish concentrations, released speedy mechanized columns on raiding missions far to the front, and launched a strong main effort in the direction of Warsaw, with the objective of closing the gap between the two groups of German forces.

The Polish forces had withdrawn hastily from southern frontier stations, failed to maintain contact between elements, fought and lost engagements on open ground without resort to position defence, and neglected opportunities to withdraw to the Vistula river in numbers and with equipment suitable to support a determined resistance in conjunction with the remaining forces in the north and west.

Air Operations: September 1-7.—The missions of the German air forces included: the destruction of communications, both rail and road, and the systematic reduction of Polish air forces and air installations. The attacks on the Polish railway net centred along the main north-south lines. These included the Bialystok-Brest-Kowel-Lwow sector; the Mlawa-Warsaw-Lublin-Przemysl sector and the Gdynia-Bromberg-Kattowice sector. Junction points where control stations and equipment were concentrated were the initial targets. The few main highways converged on these rail junctions in most cases and these were included in the air attacks. The air force mission, directed toward the destruction of Polish air bases, was accomplished with speed and precision. Forty-eight hours after the opening of hostilities, the Germans claimed that the Polish air forces had been destroyed or rendered inoperative. In many cases Polish planes were bombed in the open on Polish airfields. Hangars and other ground installations were destroyed, airfields were rendered useless by severe concentrated bomb raids, while scattered Polish air forces, engaged in brief aerial combat, were overwhelmed by superior numbers and driven to the ground. It is significant that by the 4th of September German aerial attacks were directed against industrial aviation targets indicating that the primary missions had been accomplished and active Polish air resistance considered non-existent.

Summary of Operations: September 1-7.—German forces on the land and in the air advanced rapidly, overcoming all Polish resistance. In the north

the German drive slowed down in the vicinity of Warsaw, and Polish forces began a delayed but definite concentration of strength along interior defence lines north, west and south of Warsaw. Dry weather and the disorganization of preliminary troop concentrations favoured the advance of swiftly moving German mechanized troops. Destruction of communications had hampered co-ordinated action of Polish forces and prevented adoption of systematic delaying measures against mechanized columns. Large numbers of Polish forces were still intact and apparently no extensive capture of Polish troops had been accomplished despite early reports of wholesale surrender and destruction of large concentrations. It remained true, however, that frontier forces in many instances had been destroyed or dispersed while rear elements of main forces were still menaced by sudden attacks by independent mechanized columns. The primary missions of the German scheme of manoeuvre had been accomplished on schedule and with remarkable efficiency. The most serious disadvantages suffered by the Poles had been the devastating effectiveness of the German air attack which accomplished widespread destruction of Polish air strength and disrupted mobilization of several front line units and prevented concentration of reinforcements.

Northern and Southern Groups: September 8-16.—During this period the operations of the separate armies comprising these two groups resulted in joint activities. Mechanized elements of the centre army in the southern group continued to advance and on September 8 raiding parties entered the outskirts of Warsaw. The southern army (right wing) under General List, entered the town of Sandomierz at the junction of the San and Vistula rivers and faced an open approach to the north along the valley of the Vistula in the direction of Warsaw. Under General Blaskowitz, the north army (left wing) had continued to exert pressure against Polish forces north and west of Warsaw in the vicinity of Kutno. On the 14th of September, Polish reports indicated that the first serious Polish counter-attack had been launched against the left flank of the southern army group between Kutno and Lodz. It appears that this attack was a combined effort of General Kutrzeba and General Bortnowski to gain time for the completion of adequate position defences west of Warsaw. This counter-attack temporarily halted the advance of large German forces, but offered little resistance to the continued operations of the independent mechanized columns. North of Warsaw the East Prussian Army, under General von Keuchler, had determined the extent and strength of the Polish position with the aid of efficient and uninterrupted aerial observation. Realizing that the Polish concentrations were poorly organized and without any apparent artillery support, von Keuchler decided to contain the bulk of the Polish concentration along the line Pultusk-Plonsk, with small holding forces, while he shifted the main German effort to the east (left) flank, with the mission of crossing the Narew river and enveloping the Polish right. (See map: Sketch No. 3, p. 258.)

On September 10 advance German columns of the East Prussian Army crossed the Narew and by the 14th of September the main Polish concentrations had been forced to retire to the south along the Bug and Vistula rivers. In the west relentless pressure of von Kluge's Pomeranian Army, combined with the resumption of attack by the north army (left wing) of the southern group under Blaskowitz, resulted in heavy fighting around Kutno where the German columns attempted to cut off large Polish forces retreating toward Warsaw. In the north in the vicinity of Bialystok, and in the south, east of the San river, independent German forces pushed vigorously toward Brest-Litovsk and Lwow respectively. East of Warsaw, German forces on the ground, assisted by constant aerial attack, had cut the Warsaw-Brest-Litovsk railway. By September 15, after two weeks of severe engagement and suffering from heavy losses, General Bortnowski's army entered Warsaw. During the remaining two days of this period, General Kutrzeba effected the withdrawal of most of his troops from engagement with the German columns and succeeded in joining General Bortnowski in the defence of the capital. The junction of the northern and southern army corps had been accomplished and the main Polish forces were virtually surrounded in an area centred around Warsaw. The close of the period found no established lines of resistance or continuous lines of German attack. The main

effort of the German Army had not yet been realized, and the full powers of Polish resistance had not been organized. Warsaw remained the capital of a besieged but determined people.

Summary of Operations: September 8-16.—The German armies in the north and in the south continued to exert considerable pressure behind the main effort to force the final issue in a joint attack against the main Polish forces. The operations of German mechanized troops continued to be independent actions concentrated upon the swift disorganization of Polish forces wherever encountered and without regard to the maintenance, or even recognition of, German lines of communication. German air forces continued operations of brilliant precision and accomplished results which indicated the existence of an elaborate pre-campaign system of espionage and liaison. The Polish air forces, including ground installations considered secret, were promptly discovered and methodically destroyed. Air and ground liaison between observation planes and artillery directed effective fire on suitable targets. Air attack on Polish troop concentrations was uninterrupted and became more effective as Polish air resistance disappeared. The Polish main forces still remained intact, but were cut off from hope of reinforcement and faced severe shortages of essential supplies, due to the destruction of rail and highway facilities. The remaining possibilities of Polish resistance were under-rated by the German high command when it issued a communique on September 16, claiming that the only remaining tasks involved "mopping up operations."

The final unexpected development of the period broke upon the unprepared and harassed Polish nation on the morning of September 17, when Russian armed forces suddenly crossed the eastern frontier and began a second invasion of Poland. Faced theretofore with overwhelming numbers in the north, the west, and the south, subject to spectacular and sudden raids on all sides by powerful mechanized forces, Polish leaders still could count upon the heroic stand around Warsaw, followed by a slow, if necessary, retreat to the favourable defensive terrain in the eastern provinces. After September 18 the Poles faced not one enemy but two, and there now began a marked decline in Polish morale and disintegration of the Polish will to resist.

Final Operations: September 18-30.—With the advent of Russian intervention in the east, the Polish resistance withered and appeared doomed to failure. Heroic efforts were made in isolated centres. Around Kutno the joint efforts of the north army (left wing) and the southern group, in the Pomeranian Army (right wing) and the northern group, finally overcame stubborn Polish resistance after eight days of heavy fighting. This engagement called by the Germans the "Battle in the bend of the Vistula," resulted from Polish efforts to withdraw large forces to the north and east in support of the defence around Warsaw. Under General von Runstedt, the German armies gained decisive victory, capturing an estimated total of more than 150,000 prisoners and large stores of supplies. (See map: Sketch No. 4, p. 258.)

In the east the Russian forces encountered little resistance. Polish frontier guards and some reserves offered occasional and scattered defence. The principal directions of the Russian advance were toward Vilna, Bialystok and Lwow. The city of Vilna was occupied by Russian forces on September 19. Twenty-four hours earlier, advance elements of the German and Russian armies met at Brest-Litovsk. Despite these advances, the resistance of Polish forces in the vicinity of Warsaw and around the fortress town of Modlin continued stubbornly. For days the capital city held out under continuous aerial attack and artillery bombardment. Finally, on September 27, Warsaw capitulated. And on the 28th, the fortress of Modlin surrendered. The following day the German foreign office announced the completion of a treaty of "frontier and friendship" signed at Brest-Litovsk between the German and Russian commanders. Only a few Polish forces in the northwest continued to offer resistance. The coastal garrison on the peninsula of Hela had been surrounded and finally surrendered on October 2. Polish troops north of the city of Lublin, recognizing the impossibility of continuing the war, surrendered on October 5. On all sides of the compass Poland had been invaded, over-run and forced to surrender. What had begun as a classic manoeuvre by German troops on the north and on the south ended in a double penetration by joint German and Russian forces on a time schedule which offered little hope of successful resistance.

Summary of Operations.—In less than five weeks and with no more than 15 days of serious engagement, Germany had completed the speediest campaign in military history. Without disregarding the significance of the Russian invasion in the east, it remains true that the major effort was completed by the German forces. Russian intervention resulted in over-running the eastern provinces where little resistance was faced, and in

regard to military operations in the central part of the country, particularly where Polish resistance was stubborn, the Russian intervention affected the morale of the Polish troops more than the actual reduction of numbers or destruction of organized efforts. Approximately 700,000 Polish prisoners, 40,000 horses, 1,600 guns, 8,000 machine guns, hundreds of small weapons and light anti-tank guns were captured by German forces. The Polish air force had been destroyed, with the exception of a few planes flown to neighbouring neutral States. German losses, announced by Chancellor Hitler on Oct. 6, 1939, indicated that 10,572 had died, 30,322 were wounded and 3,409 had been reported missing on Sept. 30, 1939 (probably an under-estimate). Losses in motor transportation, mechanized equipment and other material were considered insignificant.

An analysis of the operations in the air, on the ground and on the sea indicates without qualification that all arms shared equally in the success of the German effort. There was evidence of complete and continuous co-operation between all elements of the German forces. When the ground troops required observation, they received it from an alert and efficient air force. When mechanized columns operated far ahead of the foot troops and extended lines of communication in what appeared to be dangerous areas, the air force promptly located and destroyed Polish artillery and prevented strong Polish concentrations prepared to launch counter-attacks. The flanks of the two main German groups held fast to their independent missions until the appropriate time to join their strength in the accomplishment of the final drive on the capital city. Along the coast, the German naval forces engaged in no serious combat with Polish naval forces and appeared to adopt a slow but persistent pressure against naval bases and the important seaport of Gdynia. Although the naval activities were not considered as spectacular as the swift march of German forces on the ground, it must be remembered that the German naval high command considered that Polish installations would eventually fall into their hands, and preferred to gain these prizes intact rather than destroyed as a result of constant and continuous bombardment.

The time factor, the strategic advantages in geography and season, and overwhelming numbers, all favoured the German scheme of manoeuvre. Polish concentrations were delayed, disorganized and ineffectual. The adoption of independent action by mechanized units introduced an unusual but highly successful method of big area disorganization against probable resistance. The weight of destructive armament has made modern mechanized troops tremendously effective wherever time and terrain favour their employment. The speed, precision, skill and efficiency of the plan, the operations and the results of the German campaign amazed an incredulous world. A nation of 30,000,000 people had been overrun, cut to pieces, and demoralized within three weeks. The German campaign in Poland will be accorded an unusual place in military history and will undoubtedly be considered one of the most brilliant of modern times. A detailed analysis of the reasons behind the Polish collapse indicate the following:

(1) Poland failed to estimate the full strength of German mobilization prior to Sept. 1, 1939.

(2) Poland failed to analyze the full possibilities of the German scheme of manoeuvre.

(3) Poland under-estimated the potentialities of the German air force—the possibilities of joint air and ground operations.

(4) Poland failed to adopt a simple scheme of manoeuvre, centred upon the early completion of a strong defensive position supported by ample reinforcements and adapted to the favourable terrain north, west and south of Warsaw.

(5) German co-ordination resulted in the systematic destruction of lines of communication along railways, highways, and radio, telephone and telegraph installations. The nerve centres of Polish control were shattered within 48 hours.

(6) A pre-campaign espionage system proved invaluable to the German high command.

(7) Weather conditions favourable to the offensive, and in the face of constantly diminishing resistance, permitted the use of mechanized columns without regard to normal security measures.

The Polish battlefield was a platform where the final results of a carefully conceived, well-organized, and ably-led scheme of manoeuvre were exhibited. Germany had planned carefully, acted fearlessly and gained victory on that field of battle. The greatest lesson that these operations appear to have shown to students of military history seems to be that time has indeed become the fourth dimension of strategy, as it has been called by the British military writer, General Rowan-Robinson. If it is true that there is time for everything, it is equally true that on the field of battle everything successful must be accomplished at the right time.

Western Front.—The military operations on the western front during the period Sept.-Dec. 1939, are best defined as preliminary reconnaissance. No large scale operations occurred involving thousands of men and machines and covering days or weeks of continued activity, seeking to gain or deny major objectives. Along the common French and German frontier, fortress troops were hidden behind modern and apparently impregnable defence zones separated by an unoccupied but dangerously quiet No Man's Land. In France the Maginot Line (*q.v.*) was completely manned by special frontier troops supported by mobilized forces of all arms. Here in elaborate field fortifications embodying the principles of defence-in-depth and equipped with modern devices for destruction of and protection against all attacks by air and land,

the French army waited for Germany to initiate the first major movement across the frontier. The French army was not idle during the period. Small operations were undoubtedly successful between the Luxemburg frontier and the Rhine. Reconnaissance parties extended activities several kilometres into the lightly fortified zones between the main defence positions. In the Saar valley, along the Moselle, through the Bienwald forest, and around the towns of Saarbrücken, Sierck, Bliescastel, Perl, Wissembourg and in dozens of tiny hamlets and villages along the front, the French attacked vigorously but with definite limited objectives. These attacks were made in movements so small that the action clearly indicated intentions of preliminary reconnaissance rather than the initiation of any larger offensive. During the period the artificial defences and the defence mechanism of the Maginot Line were perfected. Equipment and supplies were installed in preparation for the maintenance of large forces capable of offering determined and continued resistance against an invader. Overhead French aviators took to the air regularly on offensive missions including elaborate air photography of Germany's installations. Throughout the period frequent military engagements were fought and numerous raiding parties engaged in local combat.

In the first six weeks of the war France appeared to have taken the initiative in all operations reported on the ground and in the air along the western front. The result of these French operations indicate that an area 40 miles in length and varying in depth from 2 to 10 mi. was partially occupied by French forces after light and heavy artillery fire and aerial bombardment had driven scattered German troops and the remaining inhabitants to the rear. German reports indicated that a few border towns had been evacuated on orders and that desertion of certain areas was not entirely due to the success of French invasion. In late October and during November German official reports claimed that all French forces had been driven out of German territory. At the close of December neither side claimed any advantages in territorial gains. Reports of major engagements in the near future remained in the rumour stage and local communiqués indicated "no activity" or "usual inactivity."

The German defence zone called the Siegfried Line (*q.v.*) or Limes Line was considered less formidable than the French defence zone. Construction of the series of fortifications had been started at a later date and evidence of continued construction activity during the September-December period indicated that completion of the defence had not been accomplished prior to the opening of hostilities. Impartial observers agree that despite defects in construction and accepting differences in the detail of elaboration of protective devices the German defence zone still remained a considerable obstacle for the combined British and French armies. The number of German forces engaged in the defence on the western front is estimated between 60-75 divisions including all arms. During the Polish campaign when large forces were engaged in the East, it is likely that Landwehr divisions and fortress troops were the only forces actually occupying the fortifications. At the same time the 30 days required to complete the campaign in Poland offered little opportunity to the Allies for the mobilization of men and the organization for attack on a strongly fortified and adequately manned defensive zone. At the close of the Polish campaign large forces were shuttled across the German interior and the elaborate organization of the defensive zone was rushed to completion. Late in December the minor operations in the area between the two zones were discontinued. Periodic duels were reported, probably the efforts of each side to perfect ranges and test equipment. Aerial activity continued with observations as the primary mission although limited air engagements involving small numbers of aircraft were reported.

On the north flank of the western front the relations between

Belgium and Holland, and between these countries and the belligerents gave rise to considerable speculation on the probability of invasion. Concern grew on all sides but there remained evidence of an increased tempo in the "war of nerves" rather than the possibility of actual combat. Both neutrals strengthened natural and artificial defence barriers. Each mobilized large forces and proclaimed a policy of determined neutrality. In joint conference King Leopold and Queen Wilhelmina discussed action in the event of invasion by Germany. At the close of their conference, the rulers issued a plea for peace. The practical result of these efforts appeared to be that Holland was prepared to defend her frontier against armed invasion and to offer serious delay to mechanized forces seeking quick transit through the Low Land country. Belgium with small but efficient fortifications strengthened by the recently constructed Albert canal and with a modern army already mobilized, could offer serious resistance to any opponent. Invasion of Holland would result in joint defensive action by Belgium. Invasion of Belgium alone might result in joint action by Holland. In either case, the two nations were rushing defence measures and organizing their nations for determined resistance. The offers made by Belgium and Holland for peace were doomed to failure.

On the south flank of the western front, Switzerland, traditionally a neutral, took prompt measures for defence. Partial mobilization of reserves, the accumulation of reserve stores of supplies, continued manoeuvres along the border entrances through the Alps, and a proclamation of neutrality were prompt notice that any attempted invasion would be met by determined resistance.

Luxemburg had no armed forces to mobilize and offered the entire area of her tiny country as a common neutral zone for evacuation of and medical care for the wounded of all belligerents. It appears that this was done in the hope that the close of the war might find the safety zone of Luxemburg still an independent state.

Summary.—All military operations on the western front were confined to the minor preliminary activities of reconnaissance, raids, and meeting engagements of small forces. Fortifications were strengthened, equipment and supplies were accumulated, large forces were organized and non-combatants were evacuated from defence zones. Aerial reconnaissance continued and minor air engagements were reported. No major offence was initiated and no co-ordinated air and ground attacks materialized. Flanks remained inactive and neutrals increased defensive measures and mobilized to resist invasions designed to envelop the elaborate defence-in-depth systems. A stalemate on the western front had followed the lightning attack in the East. It appeared doubtful that the Allies would begin any great land offensive in the West. For the western front the leading questions at the close of 1939 were:

- (1) Will Germany sit tight on the western front and continue to fight the blockade by naval and air action?
- (2) Will Germany make a frontal attack on the western front?
- (3) Will Germany try to outflank the Maginot Line?

The War at Sea.—The war at sea produced the most action during the period Sept.-Dec. 1939. All belligerents desired free access to world markets and each employed naval strength to secure freedom of action and impede or deny free movement to the opponent. The Allies had a considerable advantage in sea power. Britain alone with superior tonnage and with adequate bases in many parts of the world could negotiate a naval blockade against Germany without delay. The French navy could assist in blockade duties, secure water routes to colonial ports, and be prepared to join in naval engagements whenever these developed.

The German fleet had less tonnage than the Allies and was forced to operate from home bases in waters blockaded or partially denied by enemy craft. The naval strategy of the Allies was directed towards two main objectives: (1) a strong naval blockade in the North sea to contain the German fleet in the Baltic, and (2) a convoy system for merchant shipping to ensure uninterrupted ocean transport. The principle upon which Britain depended for success in the accomplishment of these objectives was the belief that in any naval engagement British seapower would always be

superior in numbers, and fire power, to any opponent. It has already been emphasized that England is dependent upon uninterrupted ocean transport. This necessity requires in turn that England maintain a fleet superior to any probable opponent. Prior to Sept. 1, 1939, the Axis Powers, and possibly Japan, were considered likely opponents. Against Germany and Italy, England, with French assistance, would be required to fight in the North sea and in the Mediterranean. If Japan entered the combat England would be forced to accept the challenge in the Far East. Her conception of naval strategy against Germany and Italy included prompt and continuous blockade in the North sea followed by swift attack in the Mediterranean based upon Gibraltar and Suez.

Joint British and French naval strength in Western Europe appears impregnable. Since Germany alone of the Axis Powers is actively engaged in combat, the naval power of the Allies is a definite superiority.

German naval strategy prior to Sept. 1, 1939, appears to have been based upon two principles: (1) rapid rearmament equal to or approaching 35% of British strength; and (2) additional construction based upon new necessities claimed as the results of (1).

The largest single factor which spelled danger for the German fleet was the probability of simultaneous engagement in the North sea and in the Baltic. Russia, after September 1, was eliminated as a potential enemy in the Baltic. German attention could then be directed against the Allied blockade. The principal means available for use included the tactics of independent surface raiders, submarine attacks, extensive mining and attacks from the air. All four methods were practical, relatively simple to adopt, and the types of naval engagement which Germany could continue over the long period. The primary mission of the German fleet was the methodical destruction of both naval craft and merchant ships by independent action of raiders and submarines and the joint actions resulting from mine fields and air attacks. Early in September the Cunard liner "Athenia" was sunk (September 3-4), apparently the result of torpedo or mine. The loss indicated one type of naval warfare which could be expected to continue. The definite cause of explosion and the loss of the ship remained undetermined at the close of the year. Britain claimed that a German submarine had torpedoed the liner. Germany denied this claim and charged that the British had sunk the vessel. Regardless of these claims the loss was the initial incident in naval warfare which continued to chalk up heavy casualties in merchant vessels as well as naval craft. On September 17 the British aircraft carrier "Courageous" was attacked by a submarine, torpedoed and sunk, marking the first important armed vessel lost in naval combat. On October 14 the Germans sank the "Royal Oak," a 29,150-ton dreadnought, at Scapa Flow. This ship was rated as one of the seven largest vessels in the British navy and the circumstances of its loss while within the waters of the naval base at Scapa Flow indicated remarkable daring on the part of the German submarine crew. Air raids at Scapa Flow on October 16 resulted in the loss of the "Iron Duke," a training vessel, and in damage to the "Southampton" and the "Mohawk." On November 18 Germany began an intensive mining campaign along the east coast of England. Reports indicated that mines were being laid from low-flying aircraft in the shallow coastal waters normally open to commercial shipping. The losses of merchant ships mounted considerably and on at least one day (November 25) the Thames estuary was closed to all shipping. On November 23 the "Rawalpindi," an armed merchantman, was attacked by a surface raider and sent to the bottom. On November 30 Germany claimed that 194 ships of all classes representing 736,000 tons had been destroyed. Early in the following month (December 4) Germany threatened to sow mines around the entire coast line of the

United Kingdom and to establish zones in which all shipping was forbidden under penalty of prompt destruction. On the surface, as the result of independent raider action, undersea, by mines and U-boat, and from the air by bombardment, Germany had prosecuted a vigorous and continuous naval warfare with increasing success.

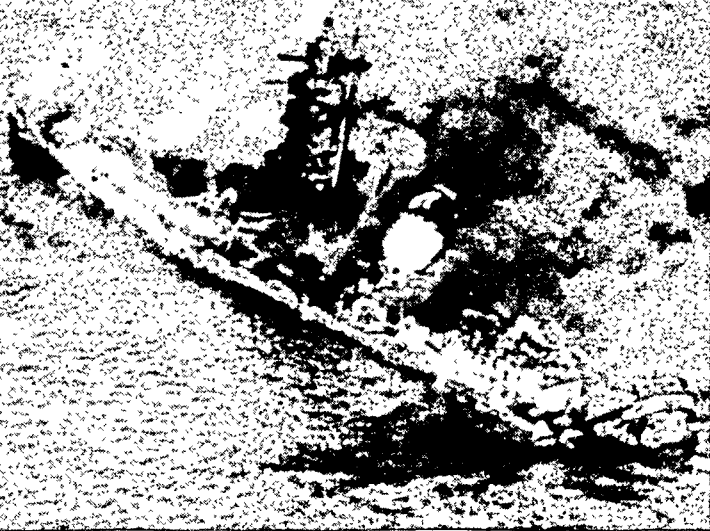
On December 13 the "Admiral Graf Spee" was suddenly attacked off the South American coast by the "Exeter," the "Ajax," and the "Achilles" of the British navy. The action resulted in a running fight, ended when the German vessel put in to the Uruguayan harbour of Montevideo. The "Exeter" was reported severely damaged and withdrew from the action for repairs in the Falkland Islands. On December 17 the "Graf Spee" was scuttled by her own crew in the outer harbour of Montevideo and as the vessel burned to the water's edge an accompanying ship took off Captain Langsdorff and his crew and took them to Buenos Aires. Three days later the captain of the scuttled ship was reported to be a suicide. The first important German naval engagement on the surface ended with considerable physical loss for Germany and world-wide speculation on the effect upon German prestige. The great German liner "Bremen" managed to run the British naval blockade after leaving the neutral port of Murmansk in Northern Russia and arrived in Germany safely. The liner "Columbus" after leaving Veracruz, Mexico, was scuttled by her own crew off the eastern coast of the United States and the survivors were brought to the harbour of New York city. At the close of the year the German naval efforts of all arms in the air, on and under the sea, had resulted in combined British and French losses of 16 men-of-war and a total of 233 Allied and neutral merchant ships. The total tonnage destroyed up to Dec. 31, 1939, is estimated at 785,485 tons. This represents an average loss of nearly two ships per day. German losses in naval craft included the spectacular destruction of the pocket battleship "Admiral Graf Spee" and an estimated total of 30-40 submarines. With the exception of the naval action off the South American coast, Allied naval attack against Germany was confined mainly to attacks by air. The greatest naval operations conducted by the Allies consisted in the persistent reduction of German imports (and after November 27) exports by means of the naval blockade. Britain claimed that nearly 900,000 tons of contraband had been seized and diverted from Germany and it appeared that the blockade would increase in effectiveness as the war continued.

Summary.—The Allied effort on the sea followed the traditional strategy imposed by limitations of geography and allowed by conditions of equipment, opponent and the necessity for obtaining maximum results with economical expenditure. The early institution of a strong naval blockade and the gradual completion of a convoy system combined to divert merchant shipping from the enemy and ensure uninterrupted ocean transport for the Allies. Minor success was gained as the result of air raids on German bases and submarine attack against isolated German craft. A considerable victory was gained in the destruction of the "Graf Spee," made more important due to the self-destruction of the vessel by the German crew and the consequent impairment of German naval prestige. At the close of the year Allied naval strength in Western Europe was under attack and losses had been suffered but the advantage appeared to rest with England and France.

German naval losses of all arms appeared relatively insignificant. Measured against these losses considerable success had resulted in following the traditional strategy of independent action by air, surface, and undersea attack. The mine-laying campaign had resulted in a spectacular if brief success and several exploits, notably the sinking of the "Royal Oak" at Scapa Flow, had reflected credit upon the naval forces. The effect of the loss of the "Graf Spee" on Germany is difficult to determine. Accepting that the German method is to calculate chances with methodical accuracy and, further, that the chances for success appeared infinitesimal it appears that self-destruction may be a logical deduction to arrive at. This deduction is not offered as a definition of the German view but appears to be one probable theory which might explain the decision made.

The German losses of submarines appeared high but not excessive considering the remarkable success secured by undersea action. German replacement of submarines is estimated by Germany to reach a total of 100 per month. Impartial observers suggest that 15 would represent a reasonable and realizable maximum. German air attacks on Allied shipping of all classes appeared more active and German losses not excessive considering the total number of actions and number of craft involved.

The growing losses of merchant shipping and the increased losses of contraband goods appear to be the most serious effect of Allied naval action



THE CLIMAX to the biggest naval battle of 1939 came December 17, when the German pocket battleship "Admiral Graf Spee" was blown up by her own commander off the harbour of Montevideo, four days after the ship was disabled in a running fight with three British cruisers

against Germany. How these losses will affect the economy of the German state cannot be determined over the short period of combat ending Dec. 1939. (See also BLOCKADE; SHIPPING, MERCHANT MARINE; SUBMARINE WARFARE.)

The War in the Air.—The great majority of people throughout the world expected the European war to open with a series of terrific air bombardments in all belligerent countries. At the close of the period (Dec. 31, 1939) no air attack on any great civilian centre had been made and the great air offensives appeared postponed. With the exception of the German air operations in the brief Polish campaign, the use of air attack against ships and bases in British waters, and the Russian bombardments in Finland marked the extent of the destructive use of the air arm.

Prior to Sept. 1, 1939, London, Berlin, Paris and the smaller belligerent cities conducted extensive and frequent black-outs as precautionary protective measures. Evacuation of children and invalids from large centres of population had been effected prior to the opening of hostilities. Air raid precautions in all large cities had become routine and complicated provisions for protection from bombs and gas were adopted in England and France particularly. It was commonly accepted that Germany had a superior air force and might launch an extended attack by air against the artificial defences of the west front, the centres of population in France and England, and the seaports and industrial life of both nations. Anti-aircraft installations were rushed to completion. Reserve forces were organized for anti-aircraft defence, balloon barrages, air nets; elaborate systems of air ground listening stations, provisions for fighter and interceptor planes, and other precautions were adopted as defence measures. In all nations and included in the reports of nearly all observers the threat of concentrated air attack appeared paramount and the first issue of the war.

The actual air operations included the following:

- (1) Extended and frequent reconnaissance by all belligerents over the frontier defences and coast line of the enemy.
- (2) Propaganda flights, particularly by the British, when leaflets were released explaining war aims and suggesting internal revolt.
- (3) Air attacks against merchant shipping, naval craft, naval bases, and seaplane installations particularly in England and infrequently along the German north coast.
- (4) Air operations in Poland. (See *German Campaign in Poland*.)
- (5) Air operations in Finland. (See *Russian Campaign in Finland*.)

On the German side the use of the air arm was confined almost exclusively to co-operative action with the naval effort against the Allied blockade. The long range bombing flights made frequent attacks against bases in the Firth of Forth and Scapa Flow, and were reported in attacks over the Shetland islands. Frequent air attacks were made against naval craft in the North sea. Mines were laid from low-flying aircraft along the coastal waters of

England. Combined with these operations, the Germans completed extensive air reconnaissance flights over England and released for publication photographs showing military targets at various harbours and bases along the Eastern coast. Air activity over the western front appeared to be confined to reconnaissance and observation flights. A few minor air engagements were reported the result of accidental rather than anticipated air combat. Observers have placed the grand total of air losses for all belligerents at 1,100–1,200 planes. Accepting that Germany employed more aircraft in a larger number of operations and would therefore suffer the larger proportional share of these losses, the total appears insignificant. Germany had ample air forces prior to September 1 and production rates would increase during the early months of the combat. Despite the success of the air arm as employed by Germany and regardless of losses or capacity for replacement, the German air force had not been seriously engaged in combat at the close of the year.

The Allies refrained from any extended use of the air arm during the period Sept.–Dec. 1939. The British air force made frequent long range observation flights over German territory. Pictures were taken of the western defence positions and some photographs of German naval bases and air installations were released to the public. Apparently the use of the air arm for propaganda purposes was considered important particularly by Britain. Reports were received of frequent flights made over Germany where large quantities of leaflets were dropped designed to incite unrest among the German readers. The results of this type of air employment appear indefinite. At least one air raid in force was reported against the German bases along the North coast, Heligoland and Sylt. These attacks were admitted or claimed and the results emphasized or ridiculed, dependent upon the source from which reports were released.

Little activity of French air forces was reported except for frequent observation flights over the western front. Occasional and minor air engagements enlivened the relative quiet.

Summary.—No belligerent initiated large scale air activities during the period Sept.–Dec. 1939. The development of aircraft and the improvement in air munitions and anti-aircraft devices indicated the lack of precedent or experience permitting the quick adoption of an air attack theory. Apparently air bombardment had far outstripped other air developments but fear of retaliation restrained leaders from early adoption of wholesale bomb raids. Full and continuous use of air observation was employed by all belligerents. Use of planes for propaganda was adopted with effects unknown. The employment of air attack against merchant ships and the use of light bombers against naval craft appeared to be the methods most regularly adopted by the German air forces. No belligerent had launched a major air effort at the close of the year. The strength of either side remained unimpaired. The probable future use of the air forces remained uncertain at the close of the year.

Russian Campaign in Finland.—Pre-Combat Phase—Oct. 7–Nov. 29, 1939.—On Oct. 7, 1939, the Russian Government requested that a delegation from Finland be sent to Moscow to open discussions for a non-aggression pact and adjustments of political and economic arrangements between the two countries. This action by Russia followed closely the completion of similar pacts made with Estonia, Latvia and Lithuania. These small states had agreed to accept Russian guarantees of assistance in the event of war, and in addition had permitted the occupation of important rail centres and coastal bases by Russian armed forces. The Russian invitation to Finland appeared to be an attempt to secure bases in Finnish territory and to acquire an extension of Russian control in the Baltic. The Finnish Government agreed to send a delegation for the purpose of examining Russian proposals, but announced publicly that Finland sought a peaceful solution of common problems and would not capitulate to Russian domination of Finnish independence. Immediate appeals for diplomatic assistance were made by Finland to her neighbours—Norway, Sweden and Denmark. The Government called military reserves to the colours and began a mobilization of some 250,000 men for "extraor-

dinary service" on Oct. 9, 1939. News reports from Leningrad indicated that approximately 500,000 Russian troops were concentrated in the vicinity of the Finnish frontier. Russian naval activity in the Baltic increased when Soviet warships began patrolling the Finnish southern coast line. A Finnish delegation arrived in Moscow to open discussions on October 11, while the Government in Helsinki warned the nation to be prepared for general mobilization and other precautionary measures in the event of emergency. A new "war of nerves" had opened along the northern front and world attention swung away from considerations of the Polish campaign and turned to follow developments in Finland.

The Russian-Finnish discussions were discontinued on October 16, when the Finnish delegation returned to Helsinki. It was announced that the Finnish delegation would return to Moscow at a later date. On October 18 the president of Finland, in a joint conference with the rulers of Sweden, Norway and Denmark, discussed mutual assistance in the event of emergency, and plans for joint action in preserving neutrality. The diplomatic observers, following the progress of this conference, estimated that peace in the Baltic states might not be maintained by joint action in the immediate future, but felt assured that the willingness to negotiate in an attempt to find peaceful solution might result in placing Russia in the rôle of aggressor in the event hostilities began. Meanwhile Finnish preparations for any eventuality continued. Air raid precautions were begun and the Government began collecting large stores of food stocks and other essential supplies for the army and for the civilian population. Unofficial sources stated that the Russian Government, among other demands, had insisted upon the occupation of three small Finnish islands adjacent to the Russian naval base at Kronstadt. Negotiations had been resumed between the Finnish and Russian delegations and the conferences continued to be held in secret, with only speculations as to the extent of Russian demands upon the small republic. On Oct. 27, 1939, Russian celebrations in commemoration of the October revolution of 1917 resulted in a postponement of conferences with the Finnish delegation. Diplomatic observers generally believed that this postponement would turn into an eventual stalemate and that the conferees would be unable to arrive at a peaceful solution. On November 13 the conferences ended and the fears of those observers who expected no concrete results were justified. A number of incidents, including the arrival of Russian planes over the Finnish frontier and several border incidents on the ground, began to intensify the Russian "war of nerves." Finnish efforts to improve her defences and to enter upon a complete emergency preparation basis were increased and the world began to recognize that Russia would probably begin the combat phase shortly. Proposals were made by the Finnish Government for resumption of peaceful negotiation on equal basis as an independent state. These proposals were rejected and Russia attempted to force immediate action and the acceptance of Soviet demands. Russia declared that the former Soviet-Finnish non-aggression pact was no longer effectual and that the increasing number of border incidents and other violations of neutrality would force Russian intervention.

On Nov. 30, 1939, Russian warships were reported enroute to the Finnish coast. Russian planes bombed Helsinki and the combat phase of the Russo-Finnish campaign began. On the same day Finland declared that a state of war existed although official sources in Moscow denied any knowledge of Soviet invasion of Finland.

On December 1, the Finnish Government resigned and a new cabinet was drafted with the governor of the Bank of Finland as head of the cabinet. The first activities of the Russian troops in crossing the Finnish frontier included welcoming Finnish peasants along the frontier and offering to set up an independent government under the protection of the Soviet. In the United States,

Mr. Roosevelt announced that "The present trend of force makes insecure the independent existence of nations in every continent and jeopardizes the rights of mankind to his own government." The "white war of nerves" had come to a close and the combat phase of the Russo-Finnish campaign had begun in real earnest.

Combat Phase — Russo-Finnish Campaign. — The Finnish scheme of manoeuvre was based primarily upon the system of interior communications, mainly rail but including a few excellent highways. The military definition of the Finnish scheme would be classified as a strategic defensive. Geographically the Finnish terrain is well suited for such a defence and with a scattered population the nation is admirably adapted for the pursuit of a wide-spread small but highly resistant series of defensive positions. Defence lines east of Viborg (Viipuri) are approached from the east through easily defensible passes. The character of the terrain renders continuous use of motorized and mechanized units unfavourable even during seasons of cold weather when the frozen marsh lands permit free movement. Innumerable lakes are a feature of the national terrain. Landing bases for an enemy are few in number and easily defended. The waters on the south skirt shallow harbours and even commercial shipping is considerably delayed in peacetime by the necessities of following devious channels into port. With recent improvements in rail and highway construction and with careful regard for the defence of the most probable avenues of invasion, Finland was prepared for prompt and strenuous defensive measures.

The general plan for Finnish defence included three main considerations:

(1) A principal defensive position in the fortified zone known as the Mannerheim Line across the land approaches through the Karelian isthmus in the south-east.

(2) Special field fortifications and improvised defence in the area north of Lake Ladoga in the vicinity of Tolvajärvi and Pitkaranta.

(3) Provisions for use of a strategic reserve force in central Finland and for support of the northern frontier in the vicinity of Petsamo.

The Finnish air force was assigned duties of observation behind frontier defences, short-range bombing tasks and shore patrol duty over the Gulf of Finland. The coast defence naval craft, including five submarines and two small battleships, were assigned harbour defence duties along the southern coast line.

The Russian Scheme of Manoeuvre.—The developments during the period closing on Dec. 31, 1939, indicate a general plan (see map: Sketch No. 1, p. 266) to invade Finland by land at three places:

(1) Across the Karelian isthmus, south of Lake Ladoga in the direction of Leningrad (Russia)—Viipuri (Finland).

(2) North of Lake Ladoga in the direction of Petrozavodsk (Russia)—Tolvajärvi and Pitkaranta (Finland).

a. In the Central Area—

(1) To the west in the direction of Kem (Russia)—Suomussalmi—Oulu (Finland).

b. In the North—

(1) South-west in the direction of Kandalaksha (Russia)—Kemi (Finland).

(2) To the south-west in the direction of Murmansk (Russia)—Kemi (Finland).

The use of air forces, particularly bombardment, and the employment of naval attack on Finnish ports along the Gulf of Finland were subordinate and included elements of the Russian scheme of manoeuvre.

Finnish Armed Forces.—Finland entered the campaign with three regular army active divisions, each approximating a total of 10,000 men. Preliminary mobilization had resulted in the expansion of this organization to a total of six divisions divided into three groups of two divisions each. In addition to these forces, Finland mobilized one cavalry brigade, five battalions of light infantry, no more than six independent batteries of heavy artillery, three battalions of coast artillery and one anti-aircraft regiment. Front line forces reached an estimated total of 125,000 men. In reserve, Finland counted upon six reserve divisions and the fron-

tier guard which consisted of about 5,000 men and were stationed along the eastern frontier. In addition to these reserves, Finland could call upon the civil guard for a total of close to 100,000 men.

Regular army.	:	125,000
Reserves (fully trained)	:	100,000
Frontier guards	:	5,000

Total.	:	230,000
Civil guard (local militia)	:	100,000

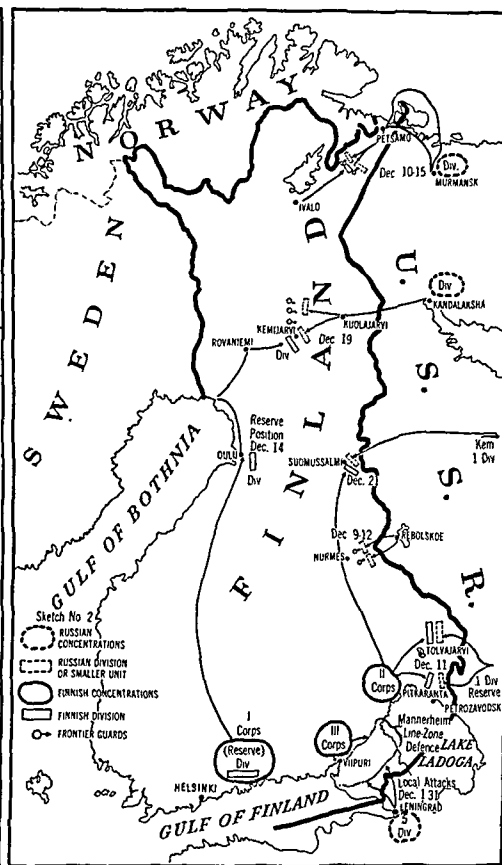
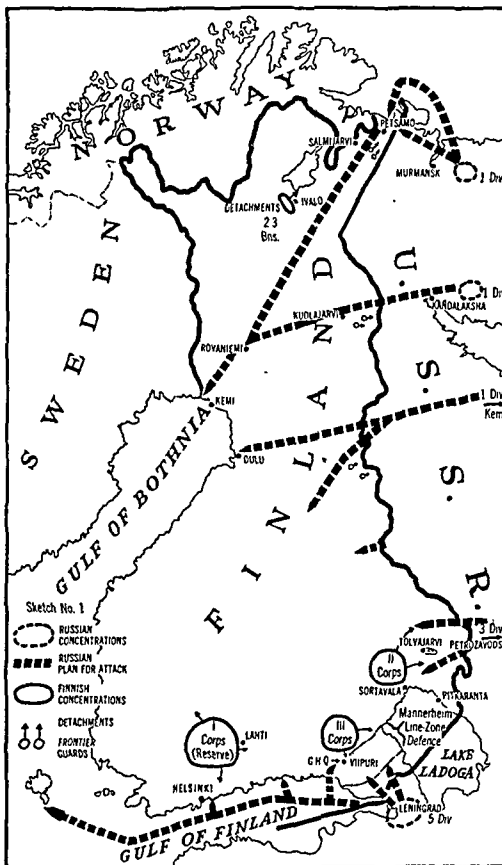
Grand Total—All Sources . 330,000

Russian Armed Forces.—No authentic figures had been released by the Russian Government describing the total and components of Russian forces. Composite estimates indicate that approximately 25 first line divisions, three to five cavalry divisions, six to seven tank brigades and considerable reserve divisions were available for the campaign in Finland. Equipment for first line troops was considered adequate, but large numbers of reserve divisions were indifferently equipped. Observers reported that the quality of equipment throughout the Russian components was generally considered no better than average. (See also *Russia*, p. 256.)

Dispositions of Forces: Finland.—Anticipating the outbreak of hostilities, the Finnish forces were divided into three groups, each of two divisions; general headquarters was located at Viipuri. II Corps was concentrated north of Lake Ladoga facing in the direction of probable Russian advance from Petrozavodsk. III Corps was concentrated in rear of the zone defence of the Mannerheim Line. I Corps was held in strategic reserve in the vicinity of Lahti. Small regular forces, not in excess of two to three battalions had been detached and sent to the vicinity of Petsamo to assist frontier guards. Along the Mannerheim Line defences reserve units had been concentrated as fortress troops. These dispositions permitted maximum freedom of action for the field army and concentrated the bulk of the striking forces in areas favourable for rail and road transportation over interior lines.

Dispositions of Forces: Russia.—The details of Russian troop dispositions were not clearly revealed. It appears that approximately one division was concentrated near Murmansk in the north. A second division was based upon Kandalaksha. A third was located at Kem. At least three divisions were located near Petrozavodsk and five divisions were concentrated north and east of Leningrad. Communication and supply units were disposed along the main rail line between Murmansk and Leningrad. These dispositions indicate the dependence upon a single railroad for communications and supply, with such assistance from Archangel and the White sea as weather conditions would permit for open water transportation. Inadequate rail and road facilities existed for large scale and continuous movements to the west in the direction of the eastern frontier of Finland.

Operations—Dec. 1–31, 1939—Russia.—Initial phase of the Russian attack consisted of demonstration in force against the Mannerheim Line along the Karelian isthmus, aerial bombardment of towns in the southern area and naval bombardment of



seaports along the southern coasts. After a week of reported attacks by air, by sea and by land, it became apparent that Finnish resistance had stiffened and that no early capitulation could be expected. (See map: Sketch No. 2.)

On December 8 advance elements of the Russian forces concentrated at Petrozavodsk, began to move to the west over the 70 miles intervening between the Russian railroad and the Finnish frontier. It appears that two divisions abreast were in this advance and a third division was held in reserve for the railroad. The Finnish II Corps moved to the north over a shorter distance and took position west and slightly south of Tolvajarvi; on December 11 the remaining II Corps, with two divisions, attacked the north (right wing) of the Russian force and divided the single division, driving the invaders to the east and over the frontier. Continuing the attack, the II Corps turned to the south and met the south (left) wing of the Russian advance and defeated the other single division in the area of Sortavala-Pitkaranta. Russian tank units were reported in difficulty along the north shore of Lake Ladoga, while in the north small Russian detachments had been halted in a frontier foray in the direction of Nurmes. Meanwhile Russian attack continued against the Mannerheim Line but appeared to be independent actions of small units including regimental operations designed to engage Finnish forces in that vicinity pending the development of major Russian attacks on other fronts.

In the north Russian detachments from Murmansk arrived by land, sea and air and attacked the seaport of Petsamo. Frontier guards defended the seaport but were unable to prevent larger forces from pushing beyond the town to the south-west in the direction of Salmijarvi-Ivalo. Before the Russian movement had gained considerable headway, the Frontier guards with the help of the local militia of civil guards and with the aid of a few battalions of regular troops met the Russian column in a major engagement. The Russian advance was checked and the invading

column was slowly turned back toward the coast and away from the major objective which had been the seaport of Kemi. In this area Russians had succeeded in capturing control of the narrow Finnish coast line and the port of Petsamo. The result of the action, however, was indecisive because the advance had been stopped far to the north of the objective.

On December 14 it became clear that advance Russian detachments were moving out of concentration areas at Kandalaksha and Kem in the direction of Kuolajarvi-Kemijarvi in the north, and Suomussalmi-Oulu in the central area. The columns from Kandalaksha consisted of an estimated strength of less than one-half of a division (two regiments of infantry with one regiment of artillery) moving slowly toward the two Finnish towns. Finnish civil guards took up a defence along the Kemi river while ski patrols of the frontier guards attacked the extended communication line of the Russian column. One division of the I Corps from the concentration area near Lahti was sent north by rail to the area Kemi-Oulu. The advance of Russian forces from the concentration at Kem appeared to be slower than the Russian advance to the north. The divisions of the I Corps of the Finnish forces moved swiftly to the north by rail from Oulu to Rovaniemi on December 19, continuing by rail to the vicinity of Kemijarvi where the Finnish forces met and defeated the Russian column in the area of Kemijarvi-Kuolajarvi. This engagement has been described as the battle of Salla, the second name given to the town of Kuolajarvi.

On December 20 the Russian advance in the direction of Kemi-Suomussalmi-Oulu approached the entrance to the town of Suomussalmi. The strength of these Russian forces is not definitely known but appears to have been close to a complete division. The II Corps of the Finnish army had been successful in the vicinity of Sortavala against Russian attacks north of Lake Ladoga. One division of the II Corps was sent north by rail via Nurmee to Hyrynsalmi with a mission of attacking the Russian forces in that vicinity. On December 21 the two forces met in the battle of Suomussalmi and the Finnish division defeated the Russian column. The action appears to have included practically a complete envelopment of the Russian troops and in combination with ski patrol raids made by the local militia, the regular Finnish forces cut off the Russian retreat to the east. Towards the close of the month, December 23-31, elements of the victorious division of the II Finnish Corps advanced in the direction of the Russian base at Repola. Scattered ski patrol raids by Finnish civil guards and frontier guards across the Russian border were reported.

Summary of Operations to Dec. 31, 1939.—The Russian campaign in Finland appeared to be immobilized on all fronts at the close of the year. In the north the Russian advances had been held up in the area of Salmijarvi-Ivalo where small Finnish forces including regular army detachments and local militia had succeeded in turning the invading columns away from their main objective. The concentration of Russian forces in Kandalaksha and in Kem had closed the frontier independently but had been defeated in turn by equal, if not superior, Finnish divisions. The Russian drive from the vicinity of Petrozavodsk had failed to penetrate the defensive north of Lake Ladoga and the Russian divisions were turned back from the frontier. Along the Karelian isthmus the independent attacks of Russian troops had been dissipated by unusual terrain and had developed into small unit attacks against the heavily fortified position defence of the Mannerheim Line. Russian air bombardment of the Finnish southern area had created considerable damage to towns and along railroad and seaport installations. The results had not weakened Finnish resistance and the lack of adequate bases combined with severe weather appeared to minimize the Russian air effort.

The disposition of the Finnish field forces and the reported use of these forces in major engagements suggested the following advantages:

- (1) Disposition allowed freedom of movement of main field forces along favourable interior lines to meet major threats.
 - (2) Rapidity of movement permitted early engagement in favourable action where it appears that Finnish forces equalled or outnumbered opponents.
 - (3) Adequate reserves were continuously available behind main defence position (Mannerheim Line) to meet larger thrust from direction of Leningrad-Viipuri.
- The close of the year found a determined Finland with high morale successfully defending along all frontiers. A small well organized force equipped with modern weapons and well led had met and defeated independently an invasion made by a larger power. The Russian forces had been unsuccessful in several attempts to develop co-ordination in land, air and naval attacks with the objective of securing an early and complete victory. The disposition and movements of the Russian forces suggested the following disadvantages:

- (1) Inadequate communication for large scale simultaneous movements.
 - (2) Failure to concentrate forces behind the main efforts of independent columns.
 - (3) Lack of co-ordination between ground and air forces.
- No official information was available from Russian sources for comment or clarification on the conduct of operations. Apparently Russian reserves were considered adequate in numbers but poorly equipped.
- It must be emphasized that during the first month of this campaign official reports were numerous, confusing, frequently contradictory and almost entirely of Finnish or Scandinavian origin.

(For important related topics see also ADVERTISING; ARCHITECTURE; BALKAN ENTENTE; BUTTER; CONTRACT BRIDGE; CANADA; CHILD WELFARE; CHINESE-JAPANESE WAR; COTTON; CZECHO-SLOVAKIA; EDUCATION; EXCHANGE RATES; EXPORTS AND IMPORTS; FINANCIAL REVIEW; GOLD RESERVES AND GOLD STANDARD; HISPANIC AMERICA AND THE EUROPEAN WAR; HORTICULTURE; HOSPITALS; INTERNATIONAL LAW; INTERNATIONAL TRADE; IRON AND STEEL; JEWISH RELIGIOUS LIFE; LIGHTNING WAR; LUMBER; MINERAL AND METAL PRICES AND PRODUCTION; MUNITIONS OF WAR; NEUTRALITY; NEWSPAPERS; PACIFISM; PETROLEUM; PROPAGANDA; RAILROADS; RELIGION; SPAIN; STOCKS; STRATEGIC MINERAL SUPPLIES; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR; TARIFFS; ZOOLOGICAL GARDENS.) (G. F. E.)

Events of the Year: see CALENDAR OF EVENTS, 1939, pages 1-18.

Exchange Equalization Account: see EXCHANGE STABILIZATION FUNDS.

Exchange Rates. Exchange rates were generally stable during the first eight months of 1939. For example, in only 13 of the 44 countries shown in the table on p. 268 was the average dollar value of the currency in June 1939 lower than in Dec. 1938; and in only five countries was it more than 1% lower: Netherlands and Netherlands Indies (2%), Rumania (4%), Brazil (12%), Peru (14%), and China (17%). This stability of the dollar value of most currencies does not mean that they were free from the pressure of adverse balances of payments. That such pressure was being exerted is indicated by the January-August flow of \$2,600,000,000 in gold to the United States, notably in March, May, and August and coming principally from the United Kingdom, the Netherlands, Belgium, Canada and Japan. But by these gold shipments and by other stabilizing and pegging devices, exchange rates were generally held firm.

European exchange rates were obliged, between Jan. and Aug. 1939, to combat flights of capital induced by repeated war scares. The Netherlands gulden was weakened throughout February as capital—particularly that of German refugees—fled the country in fear of German aggression. Strong support by the Exchange Fund was necessary to hold the gulden at 53 cents. This scare was followed by the German invasion of Prague during which European exchange rates were supported against the dollar only at the expense of heavy gold shipments. Political uncertainty in Belgium sent the belga to a large discount in the forward market during March and April until, as an expression of confidence in the new Government, capital was repatriated in May. Similarly, the gulden declined again in June and July as the Government resigned in the course of controversy over a spending program. Finally, as the cloud of the Polish crisis appeared on the horizon early in August and gathered intensity, only the most determined support prevented sharp exchange depreciation in most European countries. The pound sterling had been held at \$4.68 since February, although gold exports to the United States had been extremely large. With the sterling-dollar rate firm, the dollar rates of the Sterling Area currencies did not fluctuate. Toward the end of August, however, the British Exchange Equalization Account became virtually the only supplier of dollars in the London market and the premium on forward dollars increased. On August 25 the Account withdrew from the market, and the dollar was allowed to rise.

Before recounting the course of exchange rates following August 25, 1939, it is necessary to consider briefly the record of non-European rates up to that date. The United States dollar occupied a relatively passive position. There were no "gold scares" such as had contributed to dollar weakness during short periods in previous years. The excess of commodity exports over imports was only 60% as large as in the corresponding eight months of 1938 and wholesale prices had been very nearly stationary. In the Far East the major factor of disturbance continued to be the Chinese-Japanese War. Japan continued to lose gold, although the boom in raw silk prices materially aided her trade balance. But the yen was held firmly to sterling at a rate equivalent to slightly over 27 cents. The Shanghai dollar, less rigidly controlled, displayed conspicuous weakness. Until June its fluctuations were generally between 16 and 17 cents. But it then broke sharply to 13 cents and in July and early August declined further to a range between 7 and 8 cents. Actually, however, during the spring and summer the Japanese yen was being traded in Shanghai and North China at a dollar rate not much different from that of Shanghai

EXCHANGE RATES

Average Value of Foreign Currencies, 1938-39
In United States Cents per Unit and as a Percentage of 1929 Gold Parity

Country	Unit of Currency	Average value or rate in cents per unit				Average value as a percentage of 1929 gold parity*			
		Dec. 1938	Mar. 1939	June 1939	Sept. 1939	Dec. 1938	Mar. 1939	June 1939	Sept. 1939
<i>Europe</i>									
Belgium	Belga.	16.84	16.82	17.01	17.03	71.5	71.5	72.3	72.4
Bulgaria	Lev	1.20	1.21	1.21	1.20	98.0	99.0	98.7	98.0
Denmark	Krone	20.84	20.91	20.90	19.33	45.9	46.1	46.1	42.6
Finland	Markka.	2.06	2.06	2.06	1.90	48.2	48.3	48.2	44.6
France	Franc.	2.63	2.65	2.65	2.27	39.7	39.9	39.9	34.2
Germany	Reichsmark								
free		40.08	40.10	40.11	39.91	99.4	99.4	99.4	99.0
travel		23.38	21.83	23.26	20.90 ^b	58.0	54.2	57.9	51.9 ^b
Greece	Drachma	0.86	0.86	0.86	0.76	39.0	39.1	39.0	34.8
Hungary ^a	Pengö	19.80	19.73	19.70	19.16	67.0	66.6	66.5	64.7
Italy	Lira	5.26	5.26	5.26	5.15	59.0	59.0	59.0	57.7
Latvia	Lat.	18.52	18.55	18.54	18.52	56.7	56.8	56.8	56.7
Netherlands	Gulden	54.36	53.09	53.17	53.21	79.9	78.0	78.1	78.2
Norway	Krone	23.46	23.54	23.52	22.67	51.7	51.9	51.9	50.0
Poland	Zloty	18.86	18.86	18.81	d	99.3	99.3	99.0	d
Rumania	Leu	0.73	0.71	0.70	0.72	72.2	70.5	69.5	71.4
Spain ^a	Peseta	5.00	11.08	11.02	10.49	20.1	44.6	44.3	42.1
Sweden	Krona	24.05	24.13	24.11	23.78	53.0	53.2	53.1	52.4
Switzerland	Franc.	22.61	22.61	22.55	22.58	69.2	69.2	69.0	69.1
Turkey	£ Turk.	79.56	79.07	78.98	76.65	97.5	96.9	96.8	94.0
United Kingdom	£ Stl.	467.03	468.54	468.24	399.59	56.7	56.9	56.8	48.5
Yugoslavia	Dinar.	2.28	2.28	2.27	2.29	76.4	76.4	76.0	76.8
<i>America</i>									
Argentina	Peso								
free		22.73	22.99	23.21	23.56	31.6	32.0	32.3	32.8
official		31.13	31.23	31.22	29.77 ^f	43.3	43.5	43.4	41.2 ^f
Bolivia	Boliviano	3.29	3.39	3.40	3.24 ^g	5.3	5.3	5.3	4.9 ^g
Brazil (free)	Milreis	5.86	5.86	5.17	5.02	29.0	29.0	25.5	23.8
Canada	Can. \$	99.06	99.58	99.77	91.25	58.5	58.8	58.9	53.8
Chile	Peso								
export		4.00	4.00	4.00	4.00	19.4	19.4	19.4	19.4
official		5.18	5.17	5.17	5.18	25.1	25.1	25.1	25.1
Colombia (official)	Peso oro	57.00	56.98	57.17	57.05	34.6	34.6	34.7	34.6
Cuba	Peso	99.93	99.93	99.88	99.95 ^h	59.0	59.0	59.0	59.0 ^h
Mexico	Peso	19.93	20.03	19.77	19.02	23.6	23.7	23.4	22.6
Peru	Sol.	20.56	20.17	17.69	19.00	30.4	29.8	26.1	27.8
Uruguay	Peso	61.47	61.65	61.61	52.59	35.1	35.2	35.2	30.0
Venezuela	Bolivar	31.40	31.73	31.50	31.71	96.1	97.1	96.4	97.0
<i>Other</i>									
Australia	£ Austr.	372.06	373.27	373.13	318.4	45.2	45.3	45.3	38.6
British India	Rupee	34.86	35.06	34.92	29.93	56.4	56.7	56.5	48.5
British Malaya	Sing. \$	54.30	54.39	54.50	46.71	56.5	56.6	56.7	48.6
China	Natl. \$	16.11	16.02	13.44	6.70	22.8	22.7	19.0	9.5
Egypt	£ Egypt.	479.01	480.55	480.25	409.84	56.7	56.9	56.8	48.5
Hongkong	H.K. \$	29.17	29.05	28.92	24.86	36.5	36.4	36.2	31.1
Iran	Rial	5.80	5.82	5.82	4.96	38.4	38.5	38.5	32.8
Japan	Yen	27.21	27.30	27.28	23.46	32.2	32.4	32.3	27.8
Netherlands Indies	Gulden	54.54	53.27	53.32	53.64	80.4	78.2	78.3	79.0
New Zealand	£ N.Z.	373.72	374.78	374.60	319.8	45.4	45.5	45.5	38.8
Philippines	Peso	49.82	49.77	49.82	49.83	58.9	58.8	58.9	58.9
Thailand (Siam)	Baht	42.81	42.95	42.92	36.63	57.2	57.3	57.3	48.9
Union South Africa	£ S.A.	462.32	463.74	463.33	394.60	56.1	56.3	56.2	48.0

*Except: for China, Spain, Hongkong, Iran, Turkey, average rates for 1929; for Peru, gold parity 1930; for Yugoslavia, gold parity 1931. ^bQuotation for September 1; not available thereafter. ^cFree inland. ^dNot available. ^eDecember, Madrid quotation; others, Burgos. ^fOctober 17-23. ^gAugust.

dollars. In February, for example, the yen could be bought in North China—illegally, of course—at about 16 cents, compared with the official pegged rate in Tokyo of 27 cents; and in May it was reported that on the Shanghai open market one United States dollar would buy 6.2 Shanghai dollars and 6.3 yen. The Canadian dollar was available in New York generally at less than 1% discount. But Latin-American exchanges—largely controlled by various forms of exchange rationing—were spotty. The Mexican peso was pegged at about 20 cents until July, when it dropped to 17 cents and fluctuated at that level until the outbreak of the European war. Here continued foreign trade difficulties arising in part out of the lack of a petroleum settlement were the principal factor. Farther south the most notable fluctuations occurred in the Brazilian milreis and the Peruvian sol. In April Brazil again set up a dual rate system, with a pegged official rate and a relatively uncontrolled free rate, thus ending the Bank of Brazil's monopoly of foreign exchange. The milreis declined in the free market until September. During the spring months the Peruvian sol declined 2.5 cents but recovered half its loss and was pegged at 19 cents between August and October.

The onrush of war in Europe late in Aug. 1939 inescapably brought with it a crisis in foreign exchange markets and instability in exchange rates. In contrast with the earlier months of 1939, a comparison of average dollar values in Sept. 1939 with those of June shows that in 33 of the 44 countries in the table currencies were weaker or, in the case of Germany and Poland, were not quoted. In 16 of these countries the average dollar value in September was 10% or more below the June level: United Kingdom, France, British Malaya, Australia, British India, Egypt, Hongkong, Iran, New Zealand, Siam and South Africa—all tied to sterling; and Greece, Uruguay, Canada, China and Japan. The decline of sterling brought immediate defections from the Sterling Area. Finland, Sweden and Norway cut the tie with sterling on Aug. 28 and 29, 1939. The Danish krone hesitantly followed sterling but apparently broke loose by September 7 after a depreciation of about 7% from the level of August 24. The official rate for the Argentine peso was depreciated about 5% in late October; but the so-called free (actually controlled) rate was apparently tied to the dollar, although it began to weaken slightly in December. Japan allowed the yen to follow sterling until about the middle of September, when it was about 15% below its August 24 dollar rate of 27 cents. Thereafter Japan began converting her sterling balances into dollars—contributing to the weakness of sterling in the New York market—and pegged the

yen to the dollar at 23.44 cents. Apparently the Japanese did not want to chance the increased cost of American goods which might result if sterling declined still further.

Meantime sterling and the currencies still tied to it had been fluctuating in New York at rates between 14% and 17% of the Aug. 24, 1939, level. As soon as war was declared, the United Kingdom, France, Canada and the other British Dominions imposed stringent exchange restrictions which made possible the rationing of available foreign exchange. The pound and franc were tied together at 176½ francs per pound and the British Government fixed the buying rate for the dollar at \$4.06 (later \$4.04) per pound and the selling rate at \$4.02. But dollars were available at this official rate only if the transaction in question was approved. In the New York market sterling was sold, usually at lower rates, by persons unable to obtain dollars at the official rate. The British Government had not, up to the middle of December, taken steps to eliminate this unofficial trading in sterling. The reichsmark was not quoted in New York after the first few days of Sept. 1939. But Germany's axis-partner, Italy, held the lira at 5.05 cents after a decline from 5.26 cents in September. In November the so-called benevolent lira, used for immigrant remittances and gifts to Italians, was reduced from 4.55 cents to 4.05 cents.

The neutral currencies in Europe were steady or strong after the outbreak of war. But as threats of German invasion of Belgium and the Netherlands were given credence the dollar value of

the belga and the gulden declined moderately in the spot market and moved to wide discounts in the forward market. After three weeks of war with Russia, Finland's finmark was available in New York on December 19 at the same rate which had prevailed before the outbreak of hostilities.

Outside of Europe exchange rates had not, up to the end of 1939, been seriously affected by the European war, except where tied to sterling. The shift of some pegged currencies from sterling to the United States dollar has been noted. The Canadian dollar, dropping below 90 cents, was being controlled both by exchange restrictions and by the use of New York balances. The Mexican peso moved up strongly to 21 cents during September but dropped back again in mid-December, apparently depressed by disappointing petroleum exports. The Latin-American exchanges generally remained close to the August level, despite loss of German, and disruption to other, export trade. The moderate improvement in commodity prices was a sustaining factor. But by mid-December the Peruvian sol and the Uruguayan peso had declined. The Japanese yen, as has been explained, ended the year tied rigidly to the dollar at a rate 14% below that of August 24. The Shanghai dollar, in contrast, moved more freely, and during the last quarter of 1939 it was relatively strong, buoyed by Japanese reverses in the war.

At the end of 1938 there was some reason to hope that during 1939 considerable progress might be made toward freeing foreign exchanges from blocking and rationing. But the outbreak of war in Europe inevitably resulted in a marked increase in the number of rigidly controlled exchange rates. Belligerent powers find it necessary to husband their foreign currency resources; and neutral countries, faced by serious dislocation in foreign trade, can scarcely avoid expanding the scope of their exchange control. The import needs of the belligerents together with the course of foreign trade will determine whether year-end dollar rates of the major foreign currencies can be maintained. (See also GOLD RESERVES AND GOLD STANDARD.)

BIBLIOGRAPHY.—P. T. Ellsworth, *International Economics* (1938); Milton Gilbert, *Currency Depreciation* (1939); Imre de Vegh, *The Pound Sterling* (1939). (F. A. So.)

Exchange Stabilization Funds. Exchange stabilization funds, scarcely recovered from the strain imposed by the Czech crisis, had to offset a flight to the dollar during the Prague invasion in the spring of 1939 which provoked the flow of some \$700,000,000 of gold to the United States. Most exchange rates, however, were held stable by the determined operation of exchange funds.

The resources of the British Exchange Equalization Account were replenished on January 6 by its purchase from the Bank of England of gold then worth £350,000,000. Thus strengthened, the Account held sterling at about \$4.68 until late in August. In the spring and again in early summer the Dutch fund was obliged to intervene on a large scale to support the guilder, losing at least 300,000,000 guilders in gold. During the first seven months of 1939 the French fund was aided by continued improvement in domestic political and economic affairs. The resulting capital repatriation permitted the transfer of gold from the fund to the Bank of France for the first time since Nov. 1937.

Meantime, elsewhere in the world there had been no startling change in the use and condition of exchange stabilization funds. Early in January President Roosevelt requested continuation of the United States fund until Jan. 15, 1941. In the course of Congressional hearings on the subject it was revealed that the fund, since its establishment, had earned \$12,000,000 (increased by June 15 to \$15,000,000) and still had its original \$2,000,000,000 intact—all but about 10% of it in gold. Secretary Morgenthau assured Congress that the fund would not be used to finance arms

purchases by foreigners or to support the market for United States bonds. He also stated that, with rare exceptions, the fund does not operate in foreign currencies. That is, the Treasury does not normally take an uncollateralized foreign exchange position.

In three countries new exchange funds were set up during 1939. One was China, where a sterling credit was utilized to provide intermittent support for the Shanghai dollar. The second was Cuba, which in June announced the establishment of a national currency stabilization fund with United States dollar resources to be obtained at par from exporters. However, this exchange fund presumably marks no departure from the dollar exchange standard on which Cuba has operated. The third country was Brazil, which in October announced that it was buying \$3,000,000 in gold from the United States Treasury under an agreement made in 1937, to form the nucleus of an exchange fund.

The relative calm in international finance from May until August was apparently utilized by exchange funds to build up their dollar resources in preparation for future difficulties. By the end of August more than \$1,100,000,000 in gold was earmarked for foreign account by the Federal Reserve banks, and foreign central bank deposits in New York totalled about \$400,000,000. But with the onset of Polish-German friction, a renewed flight of capital to the United States began. Sterling, for example, demanded increasingly heavy support from the exchange account during August, and by the 25th the account stopped supplying dollars and allowed sterling to decline. On September 6, the remaining gold in the Bank of England was transferred to the exchange account.

Under war conditions European exchange fund operations have necessarily been modified. Except for the currencies of the British Dominions and the French franc, the sterling area has largely been replaced by a dollar area in which exchange stabilization operations consist principally of pegging through the medium of dollar resources. The pound sterling itself is pegged to the dollar primarily by means of exchange rationing and the exchange account is apparently giving little or no attention to the unofficial "free" sterling rate in New York. With private gold export rigorously controlled and all official gold reserves concentrated in the exchange account, the effect of gold outflow on England's domestic economy is no longer a problem. The French franc is also under wartime control, and, with the sterling-franc rate pegged at 176½ francs to the pound, both countries are virtually on a dollar exchange standard. In both countries the wartime problem is one of husbanding and rationing foreign, especially dollar, reserves by every device necessary.

The United States Exchange Fund apparently did not support foreign currencies during the Polish crisis. Whether after European hostilities began the fund was active is not publicly known; but in mid-September the Secretary of the Treasury announced that the Tripartite Agreement was still in force and that its principle of co-operation was still being observed. (See also EXCHANGE RATES; GOLD RESERVES AND GOLD STANDARD.)

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"Exeter": see EUROPEAN WAR; SUBMARINE WARFARE.
Exhibitions and Fairs: see FAIRS AND EXHIBITIONS.

Exploration and Discovery. Arctic. — U.S.S.R.: The Arctic work of the Soviet Union continues to surpass in extent and variety that done by other nations. It rests on a broad program of economic and strategic development. Varied and careful scientific studies contribute to the same ends, as well as to those of pure science.

Eleven freighters completed the Northeast Passage the season

of 1939, while sections of the passage were traversed by 104 vessels, carrying freight to settlements, ports, and scientific stations along the Arctic coast of Siberia and on the islands to the north. The freighters were accompanied by ice-breakers, and air reconnaissance of ice conditions along the route was considerably increased. Additional beacons, navigation lights and channel markers were placed. Fifty different kinds of new charts and sailing directions for the Kara sea and several other sections of the Northern Sea Route have been issued. Settlements along the route continue to flourish. Arctic ports are being equipped at Dickson island and at Tixie bay.

Igarka, 300 miles south from the mouth of the Yenisei river, though 50 miles north of the Arctic Circle, has grown in ten years from some hundreds to more than 15,000 people. Work has begun for a modern port at Providence bay on the Chukotsk peninsula, across from Alaska.

The Chief Administration of the Northern Sea Route continues to organize fuel bases at the principal coal and oil deposits within the Arctic. Most of the northern fleet now uses Arctic coal. An important new fuel centre is in the basin of the Pechora river beyond the Circle. To speed up transportation of this coal and oil, a railway crossing the eastern part of the Archangel region is under construction.

The ice-breaker "Sedov," which was caught in the ice of the Laptev sea in Oct. 1937, is on its third winter's drift. The crew are in good health and busy carrying on the program of meteorological, oceanographic and other studies. In February and again in March the "Sedov" surpassed the record of 85° 57' N. which Nansen's "Fram" established in Oct. 1895, for the most northerly drift of a ship. An all-time record was established on August 31 when the "Sedov" reached 86° 40' N., 47° 55' E. On December 7 the ship was at about 83° N., 5° 37' E. When near 86½° N., 39° E., a sounding line of 5,180 metres was paid out without reaching bottom; other soundings in the vicinity indicated depths exceeding 5,000 metres.

Perhaps the outstanding single 1939 achievement in Soviet exploratory aviation was the flight of M. V. Vodopyanov over the Kara sea on May 24, about 3,700 miles. The plane sprayed the ice beneath with paint, so that on later flights the speed and direction of the drift could be determined. The regular northern air services were continued; Soviet pilots flew more than 1,000,000 miles within the Arctic during 1939. Airports with wireless have been established at Anadyr, Cape Schmidt, and other spots on the Chukotsk peninsula. The scientific work of the 57 Arctic scientific stations was continued.

Alaska: Contracts were let by the Navy and work was commenced on naval air stations at Kodiak and Sitka, the two bases to cost an estimated total of \$13,000,000. There is a \$4,000,000 Army air base development at Fairbanks which will be used as a cold weather experimental field.

The work of the Alaska branch of the Geological Survey included: mapping the east-central part of the Alaska range, principally between Delta and Johnson rivers; geological surveys in the northwestern part of Chichagof island, southern Alaska; in-

vestigation of potential tin fields of western Seward peninsula; topographic surveys in the Porcupine river district from Fort Yukon to the Canadian boundary; revision of much of the early exploratory mapping between Nabesna and Chisana rivers, near the head of Tanana river; investigation of mineral resources and of new mining developments.

An expedition from the University of Alaska and the American Museum of Natural History did archaeological work near Point Hope. The finds were "the least Eskimo" of anything so far unearthed in the Arctic. Preliminary study is said to indicate these collections represent the oldest culture yet found in the Arctic.

Work by Americans included the 15th Arctic voyage of R. A. Bartlett, with a farthest north of 77° 18' N. off the northeast coast of Greenland. D. B. MacMillan made his 18th Arctic voyage, this time Labrador, Baffin island, and along the west coast of Greenland. The University of Minnesota botanical expedition to Hudson Bay spent the summer exploring, particularly the Richmond Gulf area and the Belcher islands. An American Geographical Society party, led by Walter A. Wood, completed an aerial survey of 2,000 sq.mi. in the St. Elias mountain range, Yukon Territory. Mr. and Mrs. A. L. Washburn completed their second summer's geological work on Victoria island, using aeroplane transport.

Canada: The Government's annual Eastern Arctic patrol covered 10,600 mi. of northern waters aboard the Hudson's Bay Company ship "Nascopie." Members of the patrol included scientists and technical officers of the Canadian Government, other scientific observers, a detachment of Royal Canadian Mounted Police, and tourists. The expedition called at 22 posts, leaving supplies, mail, and new personnel.

In the Canadian Arctic and sub-Arctic the aeroplane continues gaining importance. During 1939 the Royal Canadian Mounted Police introduced its own aircraft for inspection and patrol duty. Air inspection visits to many of the northern posts were made by officers of the Hudson's Bay Company. Private aviation companies have regularly scheduled flights, both summer and winter, to Aklavik, Coppermine and other Arctic points; a further number of unscheduled trips were made to such places as Cambridge bay and Reed island, taking in scientists, bringing out traders with their fur, etc.

While there has been as yet no mineral production on a commercial scale north of the Arctic Circle in the Canadian sector, there was steady progress in Canada's radium industry on the edge of the Circle, where the world's richest pitchblende ore is being mined at Great Bear lake; the production of radium has passed the 100-gram mark, with a substantial return from uranium oxide and other minerals.

The Canadian Government's reindeer herd on the Mackenzie delta now numbers 4,146. A band of 900 which was separated from the main herd and driven eastward in Dec. 1938, has been established in the Anderson valley under native management; there was a satisfactory fawn crop, with the Aug. 1939, round-up showing 1,196 animals.

Richard Finnie, Canadian Arctic student who has been making a motion picture record of life and progress throughout the Northwest Territories over a period of 11 years, continued his work in the summer of 1939 in the Mackenzie district.

The Vicomte Gontran de Poncins, French anthropologist, spent the winter of 1938-39 between King William island and Pelly bay studying the primitive Eskimo groups in that area. Excavations made in Foxe basin by Graham Rowley, British archaeologist, are said to indicate that the Cape Dorset Eskimo culture is distinct



SCIENTISTS of the German Antarctic expedition landing on an ice floe in Jan. 1939. In April the expedition claimed 230,000 sq.mi. of territory previously explored by Norway

from and earlier than the Thule culture in the Eastern Canadian Arctic.

British activity fell off sharply, even before the outbreak of war. An expedition from St. Andrews university did geological work in Ubekendt island and Upernivik island, off the coast of West Greenland.

Norway is active in the exploitation and development of the portion of East Greenland where she has special privileges. Yearly scientific expeditions are sent out by Norges Svalbard-og Ishavs-Undersøkelser to this section and to Spitsbergen and Bear island. Private expeditions are constantly in the field, particularly hunters and trappers maintained in East Greenland by the stock company Arktisk Naeringsdrift A/S.

The Norwegian Fisheries Board investigated the waters about Bear island and off the west and north coasts of Spitsbergen. At Ny-Aalesund in King's bay, lat. 79° N., there has been established a hotel, with all ordinary modern comforts, including a wireless station and a doctor. The hotel was open during July and August but is designed for year-round accommodation.

Sweden: Professor Hans Ahlmann and two assistants established a base for the study of glacial economy on Clavering island, Northeast Greenland; the leader and one assistant returned in the fall, while the third member of the party is carrying the work through the winter.

A Danish expedition of five men, under the leadership of J. van Hauen, is working in the Thule district of Northwest Greenland and on Ellesmere island. With the aid of Eskimos, extensive spring sledge journeys are planned; collections of geological and zoological specimens will be made, and a study of the migration routes of the Ellesmere reindeer. N. Chr. Rasmussen (son of the famous Knud Rasmussen), the expedition's photographer, will film the party's activities.

Two Danish hunters attempted a spring sledge journey around the north of Greenland, from Walrus point on the east coast to Thule on the west, both in about $76^{\circ} 50'$ N. lat. The trip of about 3,000 mi., which would have required one or more years to complete, was planned for the purpose of further exploration of the valleys south of Peary Land. But at 81° N. the travellers were forced to turn back, due to open water and loss of several dogs.

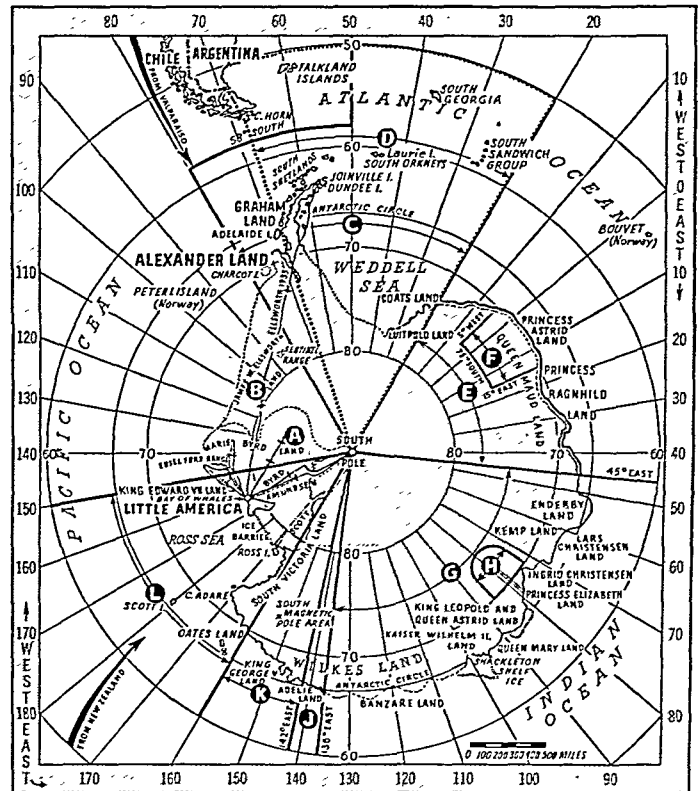
During the summer a number of individual Danes carried on scientific work of various sorts in widely separated places—among them Richard Bögvad, geological research at Ivigtut; C. L. Vebaek and one companion, archaeological studies of old Norse settlements; P. O. Pedersen and two assistants, dental studies. One of Dr. Pedersen's conclusions is that tooth decay (caries) either does not occur or is extremely rare, whether among Europeans or Eskimos, when they are living on a nearly or quite carnivorous diet.

Information is lacking on the 1939 work of the Danish North-East Greenland expedition 1938-39, the Norwegian-French expedition to Northeast Greenland 1938-40, and the French expedition to West Greenland 1938-39.

Antarctic.—With growing realization that all lands, wherever located, are valuable for potential resources or for strategic position, there was during 1939 a rush by many nations to reiterate claims to Antarctic territory or to make new ones. Official British and French declarations of sovereignty over Antarctic areas have long been on record.

Among the nations putting forward claims, officially or unofficially, during 1939, have been Argentina, Germany, Japan, Norway and the United States. Other possible claimants are the Soviet Union and Sweden.

The issues are confused by the overlapping of various claims. British declarations cover three large sectors, wedges extending



CLAIMS MADE ON THE ANTARCTIC CONTINENT up to Dec. 31, 1939: (A) Marie Byrd Land, claimed for United States by Admiral Richard E. Byrd, 1928-30 and 1933-35; (B) James W. Ellsworth Land, claimed for United States by Lincoln Ellsworth in 1935; (C) Falkland Islands dependency claim, by Great Britain, 1908 and 1917; (D) Argentina's claim, 1939; (E) Norway's claim, 1939; (F) German claim expected because of aerial mapping, 1939 (later reports give the boundaries of German claim as 14° W. and 20° E. Long.); (G) and (K) Australian Antarctic territory claim, by Great Britain, 1933; (H) claimed for United States by Ellsworth in proclamation dropped from the air, Jan. 1939; (J) claimed by France, 1938; (L) Ross dependency claim, Great Britain, 1923. The new Byrd expedition will do its major work between 80° and 150° W. Long., in the sector including (A) and (B). No country has yet formally claimed this sector.

to the South Pole, which are known as the Falkland Islands Dependencies, Ross Dependency of New Zealand, and Australian Antarctic Territory.

The French claim, Adelie Land, is a wedge that lies wholly within the Australian sector.

By a royal decree of Jan. 14, 1939, Norway showed her respect for the British boundaries and at the same time asserted her own rights when she laid claim to "That part of the mainland coast in the Antarctic extending from the limits of the Falkland Islands Dependencies in the West (the boundary of Coats Land) to the limits of the Australian Antarctic Dependency in the East (45° E. Long.) with the land lying within this coast and the enviroing sea . . .", about one-fifth of the whole Antarctic circumference.

Argentina says she has never recognized British sovereignty of the Falkland islands.

During 1939 unofficial claims were made in her press to everything in the Antarctic regions between 20° and 68° W. Long., which includes the South Orkneys, South Georgia, South Shetlands, Graham Land and all other islands in the Weddell sea previously claimed by Britain. These claims were based on the contention that this territory is a natural geographic dependency of the South American continent (and therefore of Argentina), and further that Argentina is the only country that has ever maintained true occupation in the Antarctic—having had a meteorological and magnetic observatory on Laurie island in the South Orkneys since 1904.



A GIGANTIC SNOW CRUISER was constructed in 1939 at Chicago for Richard E. Byrd's Antarctic expedition

Upon the return in April of the German Antarctic expedition (see below), a German sphere of influence was unofficially claimed for the territory observed, more than 230,000 sq.mi., all of it within the section claimed by Norway.

The claims of the United States have never been officially stated, but apparently may comprise roughly the sector lying between the Ross Dependency and the Falkland Dependency (between 80° and 150° W. Long.). These claims would rest primarily on the exploratory work of Byrd and Ellsworth; but there are older claims, based chiefly on Wilkes and Palmer, which lie within territory covered by British dependencies. In 1924 Secretary Hughes expressed the viewpoint of the Department of State that settlement, in addition to discovery, is necessary for establishing sovereignty in polar regions.

Discovery Research Committee: In May the British "Discovery II" returned from her fifth Antarctic commission, mainly oceanographic and hydrological. During the early part of the year she had continued her series of cruises over the prescribed route along the meridians of Greenwich and 20° E. and then along the edge of the pack between these meridians. As the summer advanced, higher latitudes were attained; the last two cruises reached the slope of the Antarctic continental shelf.

German Antarctic Expedition, 1938-39: The "Schwabenland," Captain Alfred Ritscher, sailed for the Antarctic in Dec. 1938, and returned in April 1939. A catapult ship, she carried two Dornier Wal 10-ton flying boats, their pilots, and a staff of scientists. The territory explored lies between 14° W. Long. and 20° E. Long. During 86½ flying hours 231,660 sq.mi. were observed, of which about 135,000 sq.mi. were photogrammetrically mapped. The

southernmost point observed from the air was about 76° S. on the Greenwich meridian.

Ellsworth Expedition: In Lincoln Ellsworth's American expedition of 1938-39 the most southerly point was reached on the flight of Jan. 11, 1939, when Ellsworth and his pilot, J. H. Lyburner, flew to about 72° S. on the meridian of 79° E. A cylinder was dropped containing a paper claiming for the United States about 80,000 sq.mi. of territory covered by the flight.

The United States Antarctic Service: Upon the appropriation of funds by Congress for an Antarctic investigation and survey, President Roosevelt named Rear Admiral Richard E. Byrd its chief. On July 20 a new governmental agency to supervise the work was formed, to be known as the United States Antarctic Service, which is directed by an inter-departmental executive committee, and is under the fiscal supervision of the Department of the Interior. Two ships were assigned to the Service, the "Bear," veteran of previous expeditions both Arctic and Antarctic, and the "North Star." Both had previously been in the Alaska service. The "Bear" for the Coast Guard (Treasury) and the "North Star" for the Department of the Interior. The "Bear" has now been commissioned as a naval vessel of the U.S. The "North Star" sailed from Philadelphia on November 21, and the "Bear" from Norfolk on November 26. There will be two posts, the East base under Richard B. Black, and the West base under Paul A. Siple, both experienced Antarctic men. The West base will be at or near Byrd's old base, Little America, while the other will be placed some hundreds of miles to the east.

The Service is equipped with four aeroplanes, a huge motorized snow cruiser, two Army tanks (stripped of armour and equipped with driver's cabs), dogs and sledges, radio, and other scientific equipment of various sorts. The objectives of the Service were announced as three-fold: (1) To make a survey and investigation of the land and sea areas of the Antarctic regions preparatory to the possible assertion of claims to sovereignty; (2) to map the (c. 1,000mi.) coastline between the two base camps; (3) to carry out a program of scientific research laid down by the National Research Council which will include investigations in geology, oceanography, meteorology, seismology, physics.

If sufficient appropriations are made by Congress, it is planned to continue the project over a period of three or four years, with any required changes in personnel and delivery of supplies annually.

Whaling Operations: During the 1938-39 season 34 factory ships, 2 shore stations and 281 catchers were engaged in Antarctic whaling. There were 12,705 active men, an increase of 1,478 over the 1937-38 figure. The "legal" pelagic whaling season, December 8 to March 7, was observed by all nations except the Japanese. Preliminary reports give oil production for the season at 2,813,546bbl. (less than the 1937-38 output), divided among the nations as follows: Great Britain, 887,596bbl.; Norway, 721,721; Germany, 492,339; Japan, 483,714; United States, 91,300; Panama, 69,050; Argentina, 66,826. Total number of whales killed was 38,321, of the following kinds: blue, 14,059; fin, 20,788; sperm, 2,591; other species, 883. (See also NATIONAL GEOGRAPHIC SOCIETY.) (V. S.)

Export-Import Bank of Washington.

The Export-Import Bank of Washington is an agency of the United States established to aid in financing and to facilitate exports and imports and the exchange of commodities between the United States and foreign countries or the agencies and nationals thereof. By Public Act No. 3, approved March 4, 1939, the 76th Congress extended the life of the Bank from June 30, 1939, to June 30, 1941, or such earlier date as the President of the United

States may fix by Executive order. The activities of the Bank increased during 1939, but were confined, as theretofore, largely to three major fields. The Bank established credits in connection with the exportation of agricultural products where facilities were not readily available through private financial institutions. In this field the Bank assisted in the sale of American raw cotton to foreign spinners and dealers by establishing, through American commercial banks, lines of credit available to American cotton shippers and guaranteed by leading banks in the countries of the purchasers. The Bank extended credits directly to American firms desiring to export industrial products, particularly heavy machinery, electrical and railway equipment. It was the practice of the Bank to offer credit terms approaching those available to the exporter's foreign competitors and in some cases the Bank assumed a portion of the risk without recourse to the American manufacturer or exporter. These transactions were accomplished usually through the discounting of obligations of the foreign purchaser endorsed or otherwise guaranteed by a sound foreign bank or, in some instances, by a foreign government.

The Bank established lines of credit up to \$20,000 each to individual firms which were experienced and of good repute but which were hampered by lack of capital in obtaining accommodations from private sources. It was the practice of the Bank to designate a commercial institution to handle such an account as agent of the Export-Import Bank of Washington. The credits were revolving and were available to the exporter upon presentation, for discount by the agent bank, of short-term drafts on approved foreign purchasers.

In addition to the above, the Bank made credits available to a number of leading Latin American banks to make dollar exchange available exclusively for the purpose of meeting promptly obligations to American exporters. The Bank specifically agreed to co-operate with several South and Central American countries and with American manufacturers and exporters in arranging for the financing in the United States of materials and equipment required for projects designed to improve the economic conditions of the countries and their trade with the United States.

From the time of its establishment to June 30, 1939, the end of the fiscal year 1939, the Bank had made commitments totalling \$250,758,547.38, of which \$100,885,381.06 had been cancelled because the interested American manufacturers failed either to obtain the foreign business or to meet the Bank's conditions. Actual disbursements amounted to \$94,872,971.21, of which \$41,319,274.86 had been repaid, leaving total loans outstanding at \$53,553,696.35. Net profit for the fiscal year 1939 was \$1,744,630.74.

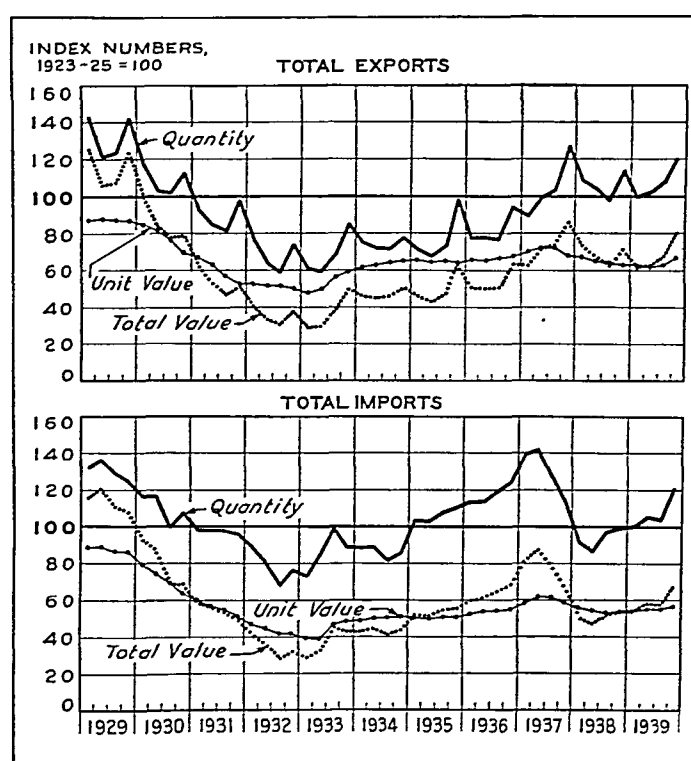
(W. L. Pl.)

Exports and Imports. The following table shows exports, imports, and balance of trade of the United States for recent years.

Year	Merchandise		Excess of exports (+) or imports (-)		
	Total Exports*	General Imports	Merchandise	Gold	Silver
		(All figures in millions of dollars)			
1929	5,241	4,399	+ 842	- 175	+ 19
1933	1,675	1,450	+ 226	+ 173	- 41
1934	2,133	1,655	+ 478	- 1,134	- 86
1935	2,283	2,047	+ 235	- 1,739	- 330
1936	2,456	2,423	+ 33	- 1,117	- 171
1937	3,349	3,084	+ 265	- 1,586	- 223
1938 (11 months)	3,094	1,960	+ 1,134	- 1,974	- 223
1939 (11 months)	2,825	1,789	+ 1,036	- 1,733	- 223
1939 (11 months)	2,810	2,071	+ 739	- 3,123	- 68

*Re-exports of imported merchandise are included.

After having reached in 1937 the highest figure since 1930, the value of United States exports in 1938 declined 7%, although the



INDEXES OF CHANGES in quantity, unit value (price) and total value of exports of United States merchandise, and imports for consumption, by quarters, 1929-39. Data for the fourth quarter of 1939 is partly estimated. Import indexes prior to 1934 are based upon "general imports"

volume was slightly larger. In the first 11 months of 1939 the value of exports was less than 1% below the value for the corresponding period of 1938. Total exports, including re-exports, were only ½% smaller. The volume of exports was slightly higher in 1939, the decrease in value being due to the lower prices prevailing in the first eight months of the year. A feature of the export trade was the marked decrease in exports of grain. In contrast, the volume of cotton exports, relatively small during the first seven months of 1939, increased in the later months, and the total volume for the 11 months was only 5% less. The war probably increased the exports of cotton and a few other products but reduced the exports of tobacco, fresh fruits, and some other agricultural products. Exports of manufactures and semi-manufactures were valued at \$2,014,000,000 in the first 11 months of 1939 as against \$1,841,000,000 in the corresponding period of 1938 and \$2,088,000,000 in 1937. There were large increases in the value of the exports of steel products, aluminium, metal-working machinery, aircraft, chemicals, rubber manufactures, cotton manufactures and other. Exports of automobiles declined about \$12,000,000.

United States imports for consumption during the first 11 months of 1939 were about 13% larger in volume and 15% larger in value than in 1938. Prices averaged about the same as in 1938, although certain import commodities rose in price after the outbreak of the war. Increased industrial activity resulted in an expansion of the imports of crude materials and semi-manufactures which accounted for about four-fifths of the rise in the value of total imports. Imports of crude materials increased 17% in volume and 26% in value; imports of semi-manufactures increased 25% and 23%, respectively. Imports of finished manufactures increased \$21,000,000 in value, newsprint paper alone accounting for \$13,500,000 of the increase. The value of total general imports for the first 11 months of 1939 was 15.7% above the corresponding period of 1938, but nearly 28% below the high total of 1937.

EXPORTS AND IMPORTS

United Kingdom.—The higher average price level, rearmament activity and the general improvement in world economic conditions in 1937 resulted in an increase in British trade of more than 20% over 1936, bringing the total to the highest level since 1929. Industrial activity slackened in 1938, the British general index declining from 132.8 in 1937 to 124.1 in 1938, and the value of foreign trade decreased 10.6%, but was still higher than in any other year since 1930. A summary of foreign trade follows:

Year	Total Imports (£ 1,000)	Exports of United Kingdom Goods (£ 1,000)	Exports of Imported Merchandise (£ 1,000)
1929	1,220,765	729,349	109,702
1933	675,016	367,909	49,081
1934	731,414	395,986	51,243
1935	756,937	425,921	55,266
1936	847,752	440,605	60,769
1937	1,027,824	521,391	75,134
1938	919,509	470,755	61,525
1938 (10 months) . .	769,543	389,165	51,725
1939 (10 months) . .	717,275	361,324	40,682

In the first eight months of 1939 British trade was still approximately at the level of 1938, imports having declined by only 1.6%, while exports of British goods increased 2.2%. In Sept. 1939 both imports and exports suffered a serious decline; in October imports rose again, while exports increased only slightly. The total decrease for the 10 months amounted to £52,268,000 or 6.8% for imports and £27,841,000 or 7.1% for British exports. In the imports for the 10 months the principal decreases were in foodstuffs (chiefly grain and flour), tobacco, rubber, wood, manufactures of non-ferrous metals, hides and skins, cotton, iron ore and scrap. Imports of manufactured articles increased £900,000, due chiefly to the higher values of imports of machinery, chemicals, vegetable textiles other than cotton, leather and manufactures, and iron. British exports of foodstuffs and raw materials declined slightly, but there was a decrease of £24,896,000 in exports of manufactures. Machinery and iron and steel accounted for more than a half of the total drop, the other chief declines being in vehicles, cotton manufactures, electrical apparatus, and woollen manufactures. Exports of non-ferrous metals, coke, vegetable textiles other than cotton, and leather were larger. Since September a new form of economic control has been in force, exercised partly by the Government and partly by the interested industrial groups, usually with the view to promoting exports as payments for the necessary imports.

Germany.—Foreign trade values in recent years for old and new Germany are summarized in the table at the top of the next column.

In the first half of 1939 nearly 40% of German trade was done with nine countries: Italy, Netherlands, the United Kingdom, Sweden, the United States, Hungary, Denmark, Belgium and Switzerland, in the order named. Imports from Rumania, Yugoslavia and Bulgaria totalled 182,064,000 marks, 6.6% of the total. Imports from Rumania were valued at 85,868,000 marks, 3.1% of the total, one-third of value being represented by 386,178 metric tons of refined mineral oils, and another third by lumber, maize, crude petroleum, barley and wheat. Trade with the Soviet Union was less than one-half of 1% of the total.

Trade for the first seven months of 1939 showed a decrease of 7.6% in imports and an increase of less than 1% in exports. Imports of wheat, rye and maize were greatly reduced, but there were large increases in imports of cotton, rubber, mineral oils, iron ores and tin. Exports of semi-manufactures of iron increased from 1,196,798 to 1,319,774 tons; exports of advanced iron manufactures and machinery were about the same as in 1938, while exports of aircraft and automotive vehicles increased 13,140 tons in quantity and 21,625,000 marks in value.

The Anglo-French blockade isolated Germany from countries

Foreign Trade Values in Germany

Year	Imports (Rm. 1,000,000)	Exports (Rm. 1,000,000)	Excess of imports (—) or exports (+) (Rm. 1,000,000)
1929	13,446.8	13,482.7	+ 35.9
1933	4,203.6	4,871.4	+ 667.8
1934	4,451.0	4,166.9	— 284.1
1935	4,158.7	4,269.7	+ 111.0
1936	4,217.9	4,786.2	+ 550.3
1937	5,468.4	5,911.0	+ 442.6
1938	5,449.3	5,256.9	— 192.4
"Greater Germany"*	6,051.7	5,619.1	— 432.6
1938 (7 months) . .	3,456.8	3,282.3	— 174.5
1939 (7 months) . .	3,194.3	3,344.5	+ 150.2

*Trade of Germany and Austria, combined, with other countries. Beginning with Oct. 1938, the trade of the Sudeten districts is also included, and since April 1, 1939, also the trade of Memel. The trade of Bohemia and Moravia is not included.

which supplied over 50% of her imports in the first half of 1939. Strenuous efforts were made to increase trade with the neutral countries, and though war supplies have the first claim on materials, exports goods are second. Trade with the Balkan countries appeared to be hampered by transportation difficulties.

France.—The following table shows the value of French foreign trade during recent years (the depreciation of the franc has made it advisable to show statistics both in actual currency values and in gold dollars):

(All figures in millions)

Year	Imports		Exports	
	Francs	Dollars	Francs	Dollars
1929	58,221	2,282	50,139	1,965
1933	28,431	1,114	18,474	724
1934	23,097	905	17,850	700
1935	20,974	822	15,496	607
1936	25,414	898	15,492	548
1937	42,391	1,005	23,938	566
1938	45,981	788	30,586	520
1938 (8 months) . .	30,492	539	18,706	331
1939 (8 months) . .	32,539	508	23,832	372

The unsettlement of internal financial, social and general economic conditions in France affected the foreign trade to an unusual degree in recent years. When industrial production slackened in most countries in the last months of 1937, however, the depression was less marked in France, though in the first half of the year production was hampered by labour troubles, high fiscal charges, and a high rate of interest. For the year, however, the index of industrial production receded only from 88 to 82. Wholesale prices in gold of 126 articles declined from an average of 71 in 1937 to 57 in 1938, and to 54 in the last quarter of the year. Exporters were thus enabled to take advantage of the situation created by the devaluation of the franc. As a result, French trade with foreign countries in 1938 showed a relative improvement over 1937, and the excess of imports over exports was reduced from 15 to 11 milliards of francs. In the first half of 1938 imports of raw materials declined, due to a temporary slackening of industrial activity, while exports remained stationary. In the second half of the year imports of raw materials increased only toward the end of the year, and imports of manufactures were reduced, while the exports, particularly of foodstuffs and manufactured articles, increased largely. Trade with the colonies increased 21.8%, as against an increase of 15.4% in the trade with foreign countries. Further progress was made in 1939 when the trade showed increases in all categories of imports and exports over 1938, and the total was larger both in francs and in gold. In the first seven months of 1939 the colonies supplied 75% of the imported foodstuffs by value and 28% of all imports, as against 73% and 26% in 1938.

Other Countries.—Italian imports and exports for the first seven months of 1939 were valued at 6,084,000,000, and 5,958,000,000 lire. Compared with the corresponding period of 1938 imports showed a decrease of 898,000,000 lire, and the exports an

increase of 63,000,000 lire. Nearly all classes of imports declined in value, the principal exceptions being cereals, copper, and hides. Exports of vehicles increased 141,000,000 lire in value, and the exports of rayon and artificial fibre products 130,000,000 lire, nearly all other classes showing lower values in 1939. Japanese trade for the first nine months of 1939 showed an increase of 170,000,000 yen in imports (chiefly in metals, fertilizers, and machinery) and an increase of 575,000,000 in exports. Exports of raw silk increased 68,000,000 yen in value, though the quantity exported went down from 44,662,000 to 36,899,000 pounds. Increases ranging from 20,000,000 to 60,000,000 yen were recorded in the exports of canned foods, chemicals, cotton yarn, metal manufactures, wood and machinery. Exports of cotton and silk piece goods declined in value, but the decline was overbalanced by the higher values of other textiles. Argentine exports for the first 11 months of 1939 totalled 11,786,292 metric tons valued at 1,418,000,000 pesos, as against 8,321,149 tons valued at 1,272,000,000 in 1938. Exports of wheat were more than doubled, rising from 1,836,032 to 4,277,384 tons, while the exports of maize increased from 2,398,623 to 3,011,149 tons. Agricultural exports in the aggregate showed an increase of 49.3% in quantity, but only 14.3% in value. Good crops had depressed agricultural prices everywhere. In the first six months of 1939 Canada exported 51,313,000 bu. of wheat, just about twice the quantity exported in 1938, but the value was nearly the same for both periods, as the price per bushel declined from \$1.18 in 1938 to 61.4 cents in 1939. Prices increased in the last quarter of 1939, however. (See also INTERNATIONAL TRADE.)

(J. J. K.)

Eye, Diseases of. **Trachoma.**—Two discoveries of great significance to sufferers from trachoma, a disease of the eyes that often results in blindness, have resulted from studies carried on over a period of years among the American Indians, great numbers of whom are afflicted with the disease. That the disease is contagious and hence due to some exogenous agent has been known for many years. The causative agent, however, had not been determined until recently. It is now generally conceded that the etiologic agent belongs to the group of filterable viruses. The particle size of the virus is probably relatively large and it may be identical with the elementary body of Prowazek and Halberstaedter.

The most effective treatment known for trachoma when administered during the early stages of the disease is sulphanilamide, first used by Dr. Fred Loe, of the Indian Medical Service, in Aug. 1937. The symptoms of the disease disappear within a few days after treatment is begun, and complete cures are accomplished within a few weeks in the majority of cases treated. The prevention of blindness from trachoma in thousands of people makes this use of sulphanilamide probably the greatest benefaction of this most important drug that has yet been reported.

Optic Neuritis.—Toxic amblyopia, or blindness from the effect of exogenous poisons such as alcohol and tobacco on the optic nerve, is found to be the result of deficiencies of vitamins in the diet. The addition of stated amounts of vitamin B₁ will restore vision in cases of recent blindness, even though the use of alcohol and tobacco be continued in excessive amounts. The same vitamin is found to be effective in preventing blindness in persons who are given tryparsamide for syphilis of the central nervous system.

Vitamin Therapy.—The mechanism of vision is a complicated function of physical and chemical actions and reactions within the eye. The nervous visual elements are rod- and cone-shaped cells in the retina which contain nerve endings sensitive to change produced by light on a photosensitive substance contained in the rods and known as visual purple. This substance has been shown to be identical with vitamin A. Night blindness is an hereditary

disease of the eye in which there is a deficiency of visual purple in the visual cells. It has been assumed that persons whose diet was consistently poor in vitamin A or who assimilated less than the normal amount would exhibit impaired vision due to a raised light threshold. On basis of this assumption, great quantities of vitamin A in various marketable forms have been added to the diet of under-nourished persons. The evidence of vitamin A deficiency has rested on a test for one's light threshold. If found to be raised above that of a supposedly normal individual, it constituted *prima facie* evidence of vitamin A deficiency. Recently, carefully controlled research has shown that elimination of vitamin A from the diet of a healthy adult for nine months does not necessarily result in a raised light threshold nor in any noticeable way impair the health of the individual. Administration of vitamin A to persons who have hereditary night blindness does not materially improve the vision.

Surgery of the Cornea.—Recent improvements in the technique of operation for deeply scarred and clouded corneas have made possible the transplantation of sections of the entire thickness of the cornea from one human eye to an eye of another person.

If the eye is otherwise in good functional condition, a section of the clouded cornea may be removed and a similar section of clear cornea removed from another human eye and transplanted to the damaged eye so that useful vision may be obtained through the transplanted clear cornea. It is not necessary to take the transplant from a living eye.

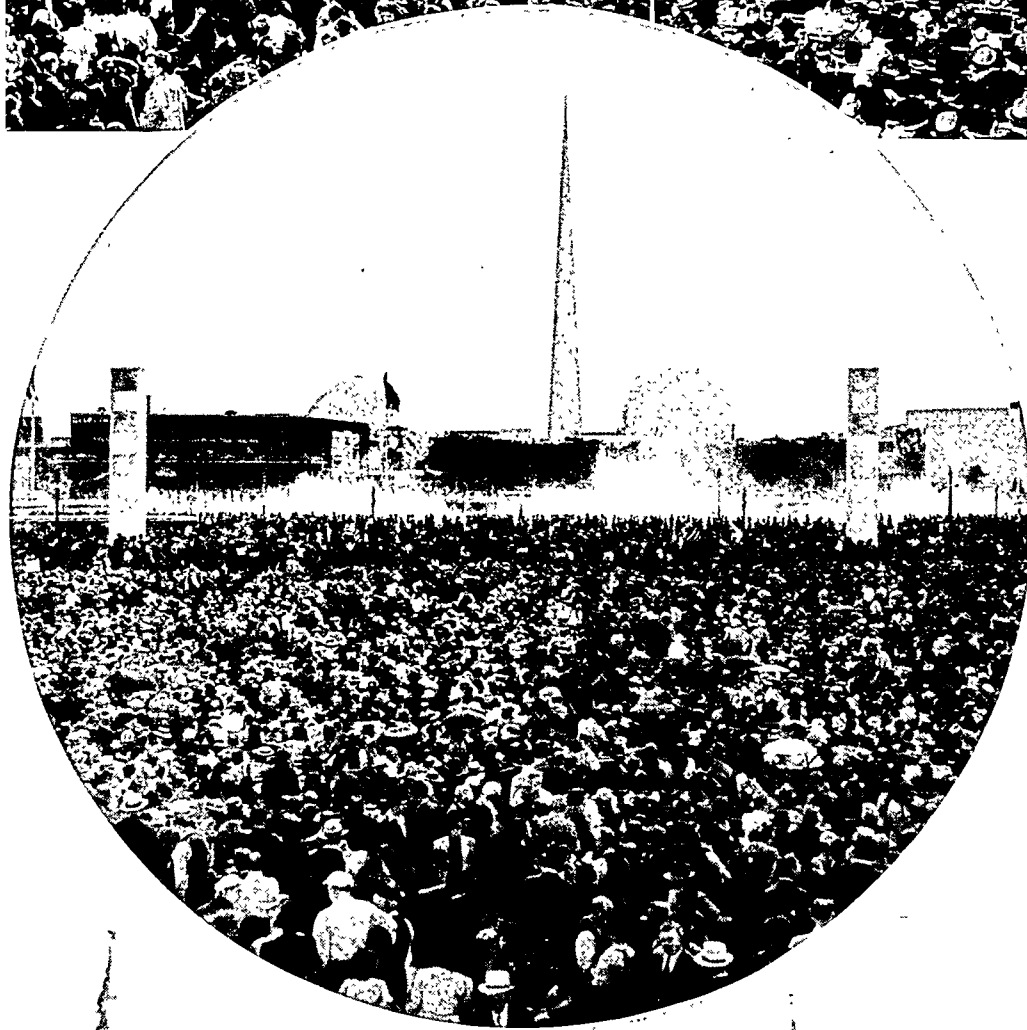
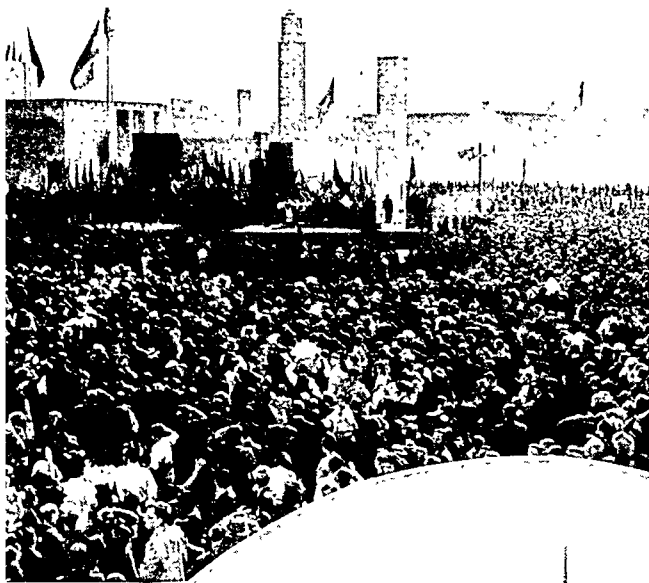
Sections may be taken from the clear cornea of an eye removed because of injury or some other cause and kept at a low temperature for several weeks. Eyes of infants or adolescents are more likely to have clear, healthy corneas than those of elderly persons and are preferred as sources of corneal transplants.

Cancer Prognosis.—Recently evolved methods of preparation for pathological study of malignant melanomas of the eye have formed the basis for classification that has prognostic value. The tumours are classified according to their cell type and fibre content. Five cell-types are recognized; *viz.*, spindle A, spindle B, fascicular, epithelioid and mixed. The fibre classification is based on the relative content of argyrophil fibres, as demonstrated by the Wilder reticulum stain, into three groups with sub-groups. In the classification by fibre content, malignancy of the tumour appears to be inversely proportional to the degree of intercellular invasion by argyrophil fibres. To present an example of the importance and practical application of utilizing both methods of classification: A mixed-cell tumour does not often metastasize if it is heavily fibred, but a moderately fibred, mixed-cell tumour is far more apt to metastasize than is a spindle B having approximately the same fibre content. The two classifications, used in conjunction with each other, definitely narrow the field of error in the prognosis of uveal melanoma. (See also VITAMINS.)

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Facsimile Radio Transmission: see RADIO, SCIENTIFIC DEVELOPMENTS OF.

Fairbanks, Douglas (1883–1939), American motion picture actor, was born in Denver, Colo. May 23. For a biographical sketch, see *Encyclopædia Britannica*, vol. 9, p. 36. His last pictures were *Mr. Robinson Crusoe* (1932)



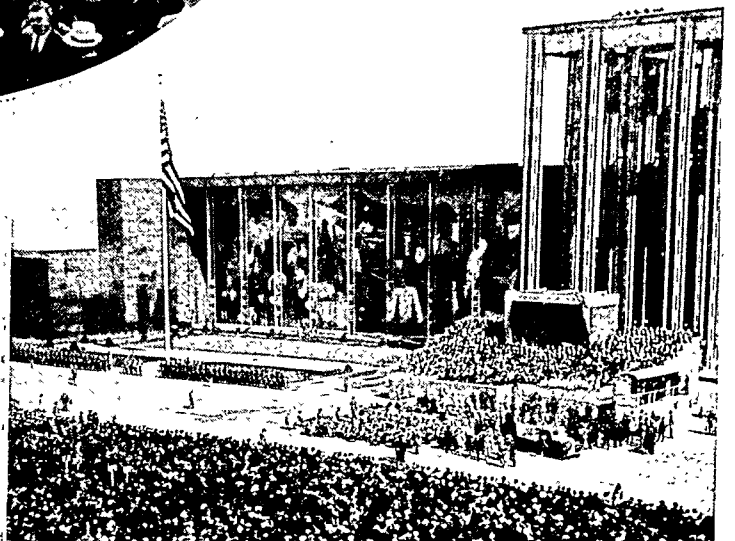
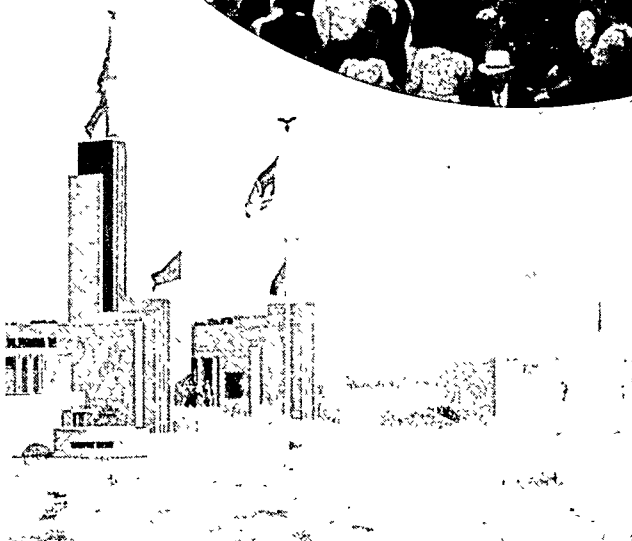
Above, left: ITALIAN DAY at the New York World's Fair in 1939

Above, right: THE COURT OF PEACE at the New York World's Fair was the scene of Sec'y of State Hull's address on the fair's Pan-American day in 1939

Centre: APPROXIMATELY 100,000 JEWS witnessed the dedication of the Jewish Palestine pavilion at the New York World's Fair May 28, 1939

Below, left: THE SOVIET PAVILION was a visitor's favourite among foreign buildings at the New York World's Fair in 1939

Below, right: CROWDS IN FRONT OF THE FEDERAL BUILDING watched the formal opening ceremonies of the Golden Gate International Exposition Feb. 18, 1939, at San Francisco



and *The Private Life of Don Juan* (1934), the latter produced in England. Though Fairbanks's career virtually ended with the passing of silent motion pictures, he continued active association with the industry and was organizing a new producing company, Fairbanks International, at the time of his death. He died December 12 at Santa Monica.

Fair Labor Standards Act: see CHILD LABOUR; COTTON: *Wage-Hour Legislation*; TEXTILE INDUSTRY; UNITED STATES.

Fairs and Exhibitions, or Expositions, these words are used interchangeably, especially fairs and expositions. Today fairs and expositions may be grouped in two main classifications. The first is where the participation of exhibitors and Government agencies is practically restricted to the country or section of the country in which it is held, for example the Texas Centennial Exposition, Dallas, 1936; or San Diego, California, 1936; and Glasgow, Scotland, 1938. Secondly, those that are international in scope presenting not only industry, art, government and science of the nation in which the exposition is held, but including major participation by foreign nations, as the Exposition Internationale, Paris, 1937, at which a large number of the nations of the world distinguished themselves with exhibits.

In 1939, two major expositions were held in the United States of America, the Golden Gate Exposition, at San Francisco, Calif. and the New York World's Fair, in New York city. These two great expositions will again open in the spring of 1940. The exposition in San Francisco was held on a man-made island of 400ac. in the centre of San Francisco bay.

The theme, "Recreation—Man's Gift from a Machine Age" shares in the dedication to Western Pacific achievements, and to transportation and communications as symbolized by: "The world's two largest bridges spanning San Francisco bay, the trans-Pacific air routes, the giant water and power projects of the west; also radio, cinema, and television." After the close of the exposition, the island will become the Metropolitan Airport. Architecturally, this exposition's palaces combine the beauty and dramatic phases of oriental and occidental architecture. Internally, these palaces more nearly follow the older type plan of large halls with great roof spans, externally presenting architectural units and harmony. The main backbone of the plan is L-shaped, made up of two avenues at right angle to each other. At this main intersection is a great circular court in which the dominating feature is the exposition tower 400ft. high. This exposition closed its gates with an attendance of 10,496,203 paid admissions.

The New York World's Fair opened in May 1939, presenting an entirely different picture from the exposition in San Francisco, being much larger, covering 1,216ac., including parking areas and transportation facilities. The site is at Flushing Meadow Park, in the borough of Queens, Long Island. Here the exposition reclaimed a swamp which, at its close, will be a public park.

The exposition's theme is "The World of Tomorrow." The exhibits of industry, science, art, education and government portray a vast panorama, showing that what man is building today will be the world of tomorrow; with emphasis on the vital necessity of rational co-operation among nations, classes and people. The plan of the exposition is functional in that the designers placed an important plaza at each entrance, from which radiate broad avenues to the focal theme building, called the "Trylon and the Perisphere," the Perisphere being a true sphere, 180ft. in diameter, alongside which stands the Trylon, triangular in plan and tapering to a point some 720ft. in height. Inside this Perisphere, reached by 80-ft. escalators, is a dramatic presentation of the exposition's theme, emphasizing the interdependence of man.

All phases of American industry, commerce, and transportation

are shown, many in their own distinctive and individual buildings; thus it may be said that the architecture reflected the individual freedom of thoughts of those creating it. Similarly this repeats itself in the most impressive foreign participation that any American exposition has ever had, some 62 foreign nations with buildings and exhibits adjacent to the dignified United States Federal group. Architecturally, and from the point of view of exhibit design, many of the foreign nations presented new and stimulating forms and ideas. The New York World's Fair closed its gates with a total of 25,817,265 paid admissions.

Both expositions had on view significant exhibits of art, San Francisco with its outstanding collection of Italian Masters, shown in the United States of America for the first time. After the exposition closed they were on view in Chicago and New York. In the New York World's Fair, a special building housed a collection of paintings called "Masterpieces of Art," portraying the great epochs of European Art from the Middle Ages to 1800; valued at \$30,000,000. (L. Sk.)

Fair Trade Laws: see LAW (CASE): *Trade Regulations*.

Falk Foundation, The Maurice and Laura,

Pittsburgh, under its policy of attempting to promote the general economic welfare of the United States through the research study of problems affecting American trade, industry, and finance, added four new investigations to its program in 1939: a study of war-time price, wage, and fiscal policy was begun at the Brookings Institution, Washington, D.C., under a grant of \$13,000 at the joint request of the Brookings Institution and the United States War Department; a study of the trends of production and productivity in nonmanufacturing industries, 1899-1937, was inaugurated at the National Bureau of Economic Research, New York, under a \$60,000 appropriation as a sequel to a study of the trends of production and productivity in manufacturing industries, 1899-1937, initiated at the National Bureau under the Foundation's grant of \$30,000 in 1938; a study of ways and means of reducing industrial prices in the interest of expanding production, under a grant of \$21,000 to the Brookings Institution; and a study to integrate the findings of the Brookings Institution's entire program of research investigations into a single, comprehensive platform for the promotion of national prosperity, under a \$35,000 appropriation from the Foundation. The Foundation also continued through 1939 its grants to the Brookings Institution for two studies begun prior to 1939: the study of wages in relation to the distribution of the national income (\$65,000 total appropriation) and the study of the relationship of government to economic life (\$100,000 total appropriation). During 1939 the Foundation contributed \$50,000 to the general support of the Brookings Institution's research activities and appropriated \$10,000 to the Carnegie Institute of Technology, Pittsburgh, for the annual support of the Maurice Falk Professorship of Social Relations, pending payment of the Foundation's \$300,000 endowment-grant for the Professorship. (J. S. G.)

Falkland Islands: see BRITISH EMPIRE.

Farmers' Co-operatives. The Federal Farm Credit Administration, which supervises farm loan agencies of the United States and operates to extend and improve farmers' co-operative enterprises, is publishing a series of booklets, one for each State, describing farm co-operatives in each State. The purpose is educational, toward demonstrating more efficient methods, since co-operatives vary widely among the different States, both in structure and in business op-

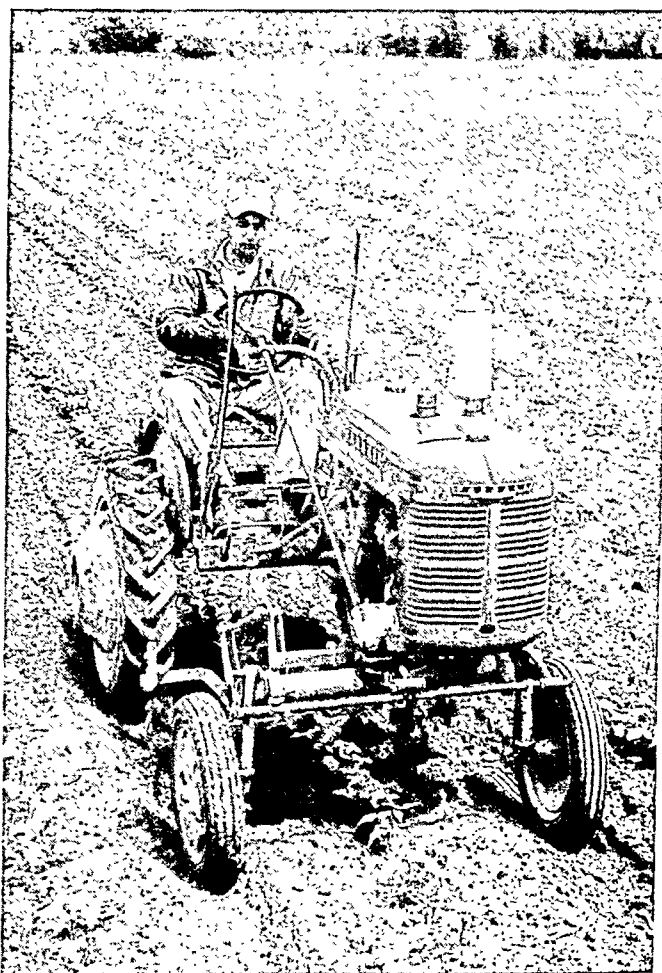
erations. Among the booklets already issued are those on Virginia, Ohio, Kentucky, Michigan, Nebraska and Kansas. The Administration's Co-operative Research and Service division issued in 1939 Circular C-113 on farm co-operatives that handle petroleum products. Owing to the widespread use of power machinery on farms 1,035 farm co-operatives in 1939 specialized in handling petroleum products. The Administration also announced that the first co-operative oil refinery, that of the Consumers' Co-operative association of North Kansas City, Mo., would be built at Phillipsburg, Kan., at a cost of \$700,000, including pipe lines. Of the 15,573 farmers' co-operative associations and mutual companies about one-half are borrowers of working or fixed capital. The peak of such borrowing in 1939, the Administration reported, was \$314,553,000, of which 39% was borrowed from commercial banks, 26% from the Federal banks for co-operatives and the remainder from individuals and other sources. The 15,573 farm co-operative enterprises include approximately 5,000 mutual telephone companies that have 669,000 subscribers (approximately one subscriber to every mile of wire) and an investment of \$27,000,000. Farmers' mutual fire insurance companies to the number of 1,950 have more than \$11,000,000,000 of insurance in force. The rapid growth of livestock auctions has provided sharp competition for farmers' livestock co-operatives and is the subject of a special study by the Administration's Research and Service division in the Aug. 1939 number of the Administration's monthly magazine, *News for Farmer Co-operatives*. (S. O. R.)

Farm Income. War's impact on prices was illustrated with unusual sharpness by the United States farm income, which in August was estimated at \$7,900,000,000 for 1939, by the Bureau of Agricultural Economics of the Dept. of Agriculture, and in October at \$8,300,000,000. In the first two weeks of the war the general index of prices received by farmers rose 10 points, the largest monthly change since the devaluation of the dollar in 1933. The annual August estimate by the Bureau of Agricultural Economics, while, of course, entirely preliminary, is usually remarkably accurate and close to the final estimate. The outbreak of war in September, however, caused the Bureau to raise its estimate from a figure lower than the income of 1938 to more than \$250,000,000 higher than that of 1938. The advance was caused chiefly by rises in the prices of grain, sugar, lard, fresh pork, beans and to a lesser extent by beef, lamb, cured meats, butter, vegetables and fruit. There were recessions from most of these advances after the first weeks of the war. The foregoing estimates include cash income for products marketed, commodities under Government loan in 1939 and Government conservation and parity payments to farmers. The comparable estimate in 1938 was \$8,020,000,000. In 1937 it was \$8,988,000,000, the highest in 10 years. Added to this, to round out the gross farm income, is the value of farm products retained on the farm for home consumption. This was estimated at \$1,200,000,000 in 1939, at \$1,279,000,000 in 1938, and at \$1,437,000,000 in 1937. Government payments were estimated as at least one-third larger in 1939 than in 1938. These payments approximated \$675,000,000 in 1939. In 1938 they were \$482,000,000, and \$367,000,000 in 1937. The farm-to-retail price spread has remained remarkably steady from 1936 to 1939 in the comparisons of 58 foods by the Bureau of Agricultural Economics. The farmer's share rose from 35 cents in 1932 to 45 cents in 1937, and remained at 40 cents in 1938 and the first seven months of 1939. War prices in September sharply reversed the downward tendency that had persisted for 2½ years. The total cash farm income has increased from the low of 1932 each year to 1938.

In 1932 it was \$4,328,000,000. But for the war-time advance the total receipts from crops in 1939 would have been about 7%

less than in 1938, or approximately \$2,925,000,000, according to the August estimate, against \$3,153,000,000 in 1938 and \$3,845,000,000 in 1937. (S. O. R.)

Farm Machinery. Experimental machines, corn combines, to pick, husk and shell corn, all in one operation, were put in the field in 1939 by several farm implement manufacturers in the United States. Results were announced as satisfactory, except engineers do not consider the experience conclusive as to the shelling operation. The 1939 harvest season was unusually dry and the hard, dry corn shelled with exceptional facility. Engineers indicate a need for experience in wet seasons when corn is soft. The value of farm machinery production in 1939 in the United States was announced as substantially over that of 1938, which was \$490,013,369. In 1937 it was \$580,945,914, and \$487,273,428 in 1936. Tractors on U.S. farms April 1, 1939, numbered 1,625,820, as compared to 1,527,989 on the same date in 1938 and 1,382,872 in 1937. These figures on tractors are from the *Farm Implement News* (Chicago), which makes a careful annual compilation that allows for obsolescence. Increased production of tractors in 1939 included a number of new small models. Production and sales of corn handling machinery were also heavy and there was a general increase in farm machinery excepting wheat combines which declined. A most unusual development in farm machinery is one which is transforming farming operations from the age-old straight lines to curves, for no longer must a farmer "plough a straight furrow." Instead he ploughs in curves



THE FARMALL-A TRACTOR, introduced in 1939, is an all-purpose machine that permits direct vision ahead

to conform to the contour of sloping fields and thus prevent erosion by washing.

Tractors on U.S. Farms by States, April 1, 1939

Alabama	9,825	Nebraska	68,835
Arizona	5,232	Nevada	450
Arkansas	13,897	New Hampshire	1,018
California	60,083	New Jersey	12,714
Colorado	18,131	New Mexico	4,558
Connecticut	4,588	New York	62,017
Delaware	3,431	North Carolina	20,716
Florida	10,798	North Dakota	50,111
Georgia	12,637	Ohio	87,168
Idaho	9,044	Oklahoma	44,697
Illinois	146,971	Oregon	13,748
Indiana	87,040	Pennsylvania	54,786
Iowa	133,410	Rhode Island	1,000
Kansas	97,262	South Carolina	6,516
Kentucky	12,812	South Dakota	44,812
Louisiana	11,930	Tennessee	13,471
Maine	5,000	Texas	107,696
Maryland	13,057	Utah	2,842
Massachusetts	6,233	Vermont	3,560
Michigan	59,501	Virginia	13,823
Minnesota	89,612	Washington	13,360
Mississippi	16,306	West Virginia	4,064
Missouri	52,179	Wisconsin	79,647
Montana	22,404	Wyoming	5,622

(Estimated by Farm Implement News.)

(S.O.R.)

Farm Mortgages. The total farm mortgage debt in the United States declined to \$7,071,000,000 in 1939, the smallest amount in twenty years. Not since 1918 has the total been smaller. It was \$6,541,000,000 in that year. The year 1923 had the largest total of farm mortgages, \$10,751,000,000, the peak of a steady advance year by year since 1910. Since 1923 the volume of farm mortgage debt has decreased every year, excepting in 1928 and 1929 over 1926 and 1927. The total of farm mortgages in the United States in 1938 was \$7,214,000,000. It was \$9,631,000,000 in 1930. In 1920 it was \$8,449,000,000. In 1910 it was \$3,208,000,000.

The volume of farm mortgages had its sharpest advance following the break in agricultural and land prices in 1920. Many farmers mortgaged their farms to pay for operating losses or to secure unpaid debts. Farm land had been at high war-time values and many sales made before the collapse involved mortgage payments after the break. Life insurance companies, Federal land banks and the then active joint stock land banks provided funds for the expanding loans. Foreclosures increased rapidly from 1923 to 1926 and in 1932 and in 1933, in which latter year Congress adopted the Emergency Farm Mortgage Act and various States passed measures to relieve debt-burdened farmers. Since then, foreclosures have declined. The decline although general, has not been uniform in all major areas, being steadiest in the west north central States, while mortgage debt increased in New England in 1936, 1937 and 1938. A comprehensive survey, "Thirty Years of Mortgage Debt," by Donald C. Horton, appears in the Oct. 1939 issue of *The Agricultural Situation*, U.S. Department of Agriculture, from which the following table of U.S. farm mortgage debt is taken:

1910	\$3,208,000,000	1925	\$9,913,000,000
1911	3,522,000,000	1926	9,726,000,000
1912	3,929,000,000	1927	9,671,000,000
1913	4,352,000,000	1928	9,765,000,000
1914	4,712,000,000	1929	9,761,000,000
1915	4,994,000,000	1930	9,631,000,000
1916	5,259,000,000	1931	9,462,000,000
1917	5,828,000,000	1932	9,213,000,000
1918	6,541,000,000	1933	8,638,000,000
1919	7,142,000,000	1934	7,887,000,000
1920	8,449,000,000	1935	7,786,000,000
1921	10,198,000,000	1936	7,639,000,000
1922	10,660,000,000	1937	7,390,000,000
1923	10,751,000,000	1938	7,214,000,000
1924	10,647,000,000	1939	7,071,000,000

(S.O.R.)

third year of a three-year movement instituted in 1937 by Congress under the Bankhead-Jones Act. At that time two of every five farmers were tenants and tenancy was increasing at the rate of 40,000 a year.

In 1937-38, \$10,000,000 was lent to 1,840 farmers in 332 counties to buy farms at an average cost of \$4,999 and an average size of 130 acres. In the second year, 1938-39, loans of \$25,000,000 were made in 732 counties, the average loan being \$5,562. For the third year, 1939-40, the sum of \$40,000,000 was appropriated, but loans totalled \$38,000,000, since 5%, or \$2,000,000, was allowed for administration. By the end of 1939-40 it is expected that 13,250 landless farmers will own farms, subject to a first mortgage held by the United States. Eligible borrowers must be tenant farmers, sharecroppers or farm labourers, and citizens of the United States. Preference is given to married men or those with dependents, to those who own livestock and tools and to those able to make a down payment. Farms on which loans are made must meet certain specifications. If necessary a loan contains provision for constructing farm buildings, and 1,600 new farm-houses have been built thereunder at an average cost of \$1,300 and according to specifications by Agricultural Department engineers. The secretary of Agriculture selects the counties in which loans are to be made, on recommendation of State Farm Security Advisory Commissions.

County committees of three farmers certify which applicants should receive loans. (S. O. R.)

Farrand, Livingston (1867-1939), U.S. educator and leader in public health movements, was born at Newark, N.J., on June 14; after graduating from Princeton he took his medical degree at Columbia, then studied for two years at Cambridge and in Berlin. From 1893 to 1914 he taught psychology and anthropology at Columbia, and from 1905 to 1914 he was also executive secretary of the National Association for the Study and Prevention of Tuberculosis. He was president of the University of Colorado from 1914 to 1919, and took a leave of absence in 1917-18 to direct the tuberculosis work of the International Health Board in France. In 1921, after serving for two years as chairman of the central committee of the American Red Cross, he was appointed president of Cornell university and held this position until his retirement as president emeritus in 1937. He died November 8 at New York city. Dr. Farrand was editor of *The American Journal of Public Health* (1912-14) and author of *Basis of American History* (1904).

Fascism is the name for a political philosophy which puts the nation-state or the race, its power and growth, into the centre of life and history. It disregards the individual and his rights, as well as humanity, in the exclusive interest of the national collectivity. As a political technique it aims at the maintenance and power of a single party which identifies itself with the state and makes it subservient to its aims. Under its guidance the whole nation is strictly regimented politically, economically and culturally; its organization is modelled after the army with its stern insistence upon authority and discipline. All individual rights and civil liberties are abolished. Fascism does not believe in the equality of individuals or races. It extols the sacred egoism of the nation, disbelieves in international co-operation, stresses military virtues and scorns humanitarian sentiments, conciliation and compromise. Fascist insistence upon the right of the stronger, its disregard for universally binding international law and for reciprocity and equal rights of peoples, were responsible for the international anarchy characteristic of the '30s in the 20th century.

During the year 1939 the fascist powers, Germany, Italy and

Farm Tenancy. For the year ending June 30, 1940, the U.S. will have lent \$38,000,000 to approximately 7,068 landless farmers in 1,300 counties to enable them to buy farms and thus help check the growing farm tenancy. This is the

Japan, supported by a number of smaller states like Spain, Hungary and Manchoukuo, had reached a very high degree of collaboration. Their diplomatic interplay and mutual support found an expression in the Anti-Comintern pact which had been concluded in 1937 and whose importance seemed to grow at the beginning of 1939 when it was joined by Hungary and Spain. It formed a kind of fascist anti-League, opposed to the democratic League of Nations, infinitely more active and showing much greater cohesion than the latter. In May 1939 the Anti-Comintern pact was strengthened by the conclusion of an outright defensive and offensive military alliance between Germany and Italy. Influential Japanese circles aimed in the middle of 1939 at the extension of the military alliance to Japan. The sudden and unexpected conclusion of the pact between the Soviet Union and National Socialist Germany in Aug. 1939 changed the whole situation. It deprived the Anti-Comintern pact of its leading member and it left Italy, Japan and the lesser members of the Anti-Comintern pact in a state of confusion. Fascism, and especially National Socialism, had proclaimed itself the bulwark against communism. Even in the democratic countries many conservatives had viewed with great favour the rise to power of fascism and national socialism and had supported them as fighters against communism and against the Soviet Union. Now all pretence of fighting communism or the Soviet Union was dropped by national socialism. The element of nationalistic collectivism or communism, always contained in national socialism, was now stressed more than before. A common front was established against the democracies which were called, by the fascists as well as by the communists, plutocratic and imperialist. In his New Year's proclamation Chancellor Hitler and the editorials in the National Socialist press proclaimed the war as an "international revolution" destined to put an end to capitalistic society. The former violent attacks against "Jewish communism" and against the "international Jewish Marxist conspiracy" were now replaced by diatribes against "Jewish capitalism," "democratic war mongers" and plots by "international bankers." The Russians were admitted with the Germans to the honour of "young and productive nations to whom belongs the future."

National Socialism remained, however, distinct from communism by its insistence upon the inequality of races. Accordingly the Czechs and Poles in the annexed territories were regarded as helot peoples and were accorded a treatment resembling that of the Jews. In view of this turn-face of National Socialism in its attitude towards communism and the Soviet Union, the other members of the Anti-Comintern pact had great difficulty in adapting themselves to the new situation. Fascist Italy remained faithful to her alliance with Germany and stressed her defiant contempt for democracy. On the other hand it tried to strengthen its position as against Germany and the Soviet Union by closer collaboration with the Vatican. As the result the Vatican condemned strongly the totalitarian state in Germany and in Russia, but praised fascism in Italy.

Outside the fascist countries fascism made hardly any progress during 1939. The new determined attitude of Great Britain and France against fascist aggression acted as a check upon fascism in all European democracies. For the first time in seven years fascism found itself internationally put on the defensive. Only in the United States fascism seems to have made some progress. The various fascist groups were united by anti-Semitism and by a strictly isolationist attitude in foreign policy. The lack of suitable leadership and of cohesion between the many small fascist and semi-fascist organizations prevented, however, fascism in the United States from reaching any real importance. The future of fascism in the United States as in Europe and the Far East, depends upon the outcome of the war, which, at the beginning of

1940, was being fought on three different, but closely connected, theatres of war. (See also ANTI-SEMITISM; COMMUNISM; DEMOCRACY; GERMANY; ITALY; JAPAN; MINORITIES; PACIFISM; SPAIN.)

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(H. Ko.)

Fashion and Dress. At the outset of 1939, women were wearing trim, youthful suits and dresses in the daytime and at night, romantic, full-skirted evening dresses. The skiers were skiing in long tapered, ski-instructor's pants, shirts, and windbreakers, and the ski skirt was just beginning to be worn by the young and expert. Fancy skating gained many new devotees, and on the rinks, full, short, velveteen or woollen skirts with bright tops and light skating boots, instead of dark ones, began to appear. Winter sports left their mark on fashion. The hooded windbreakers of the ski resorts gave us hoods—hooded fur coats, hooded capes for evening, separate hoods, woollen hoods, chiffon hoods, hoods attached to evening dresses. The skaters set the fashion for very short, flared or pleated skirts. By August, college girls were wearing them, with bare knees and long, cablestitch knitted socks.

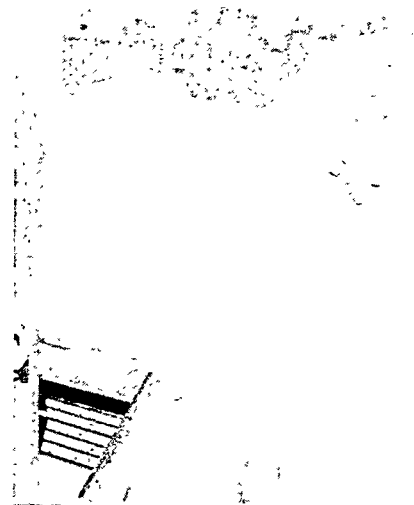
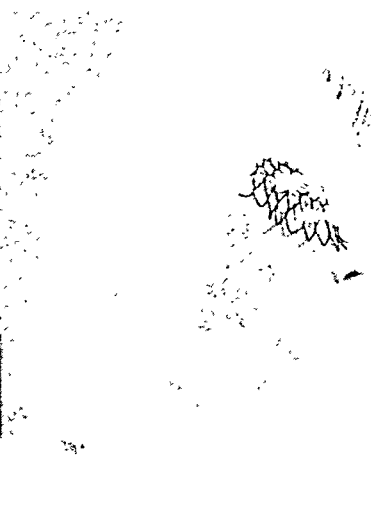
The spring of 1939 brought in more youthful, feminine suits, with pleated, flared, or straight skirts, tightly fitted jackets and gay blouses. Prime Minister Chamberlain's famous umbrella and the Chamberlain hat appeared as a motif in prints and accessories. Hats were little, coquettish and extremely feminine, sometimes no more than a mere fold of ribbon on the head. Hair stayed up in front, but went down again in back—curls or a roll on top, a long mane behind. The snood, in chenille or in fish net, was tremendously worn.

The summer brought out the bare-midriff dress, based on the already successful two-piece bathing suit. Play dresses and evening dresses were made with bare skin showing between the top and the skirt. Considered daring, at first, they caught on at the summer resorts, swept Hollywood, and became an important new trend.

In summer too, the flat sports sandal came in for a wave of popularity. Instead of the high-heeled sandal that women had worn with their summer dresses, flat peasant sandals appeared. Some were sandals copied from those of Greece, Italy, Syria or Mexico. Others were moccasins, inspired by the North American Indian.

Increased travel to South America had no repercussion on fashion, but a Brazilian singer, Carmen Miranda, appeared in a New York revue with her head done up in a fantastic turban, and towards the end of the summer, turbans came in. A draped turban in velvet or wool jersey with a big double twist of the material over the forehead was reproduced ad infinitum.

The autumn fashions were dramatic and opulent, despite the approaching war in Europe. The exhibition of the Prado paintings in Geneva, Switzerland, fired the designers with Spanish colours. Flashes of vermilion red appeared on black dresses—red hats and red accessories were seen everywhere. From the paintings of the Spanish bullfighters, came hats with long snoods of net or velvet or silk jersey falling down in back. Balenciaga, the Spanish designer, produced full-skirted Infanta dresses and Infanta head-dresses made of curling feathers. In direct contrast to the full skirted line, some evening dresses were straight, and covered the wearer from neck to wrist. One heard talk of the "cigarette silhouette" and "that covered-up look." Long sleeved, high-necked dresses were made in sumptuous materials. Pockets became important. The full skirts of dinner dresses had pockets. The pockets



Upper left: A CHANEL DRESS in the autumn collection, 1939

Upper centre: SNOODS covering the back hair or trailing from hats were popular in 1939

Upper right: HOODS were an outstanding fashion of 1939

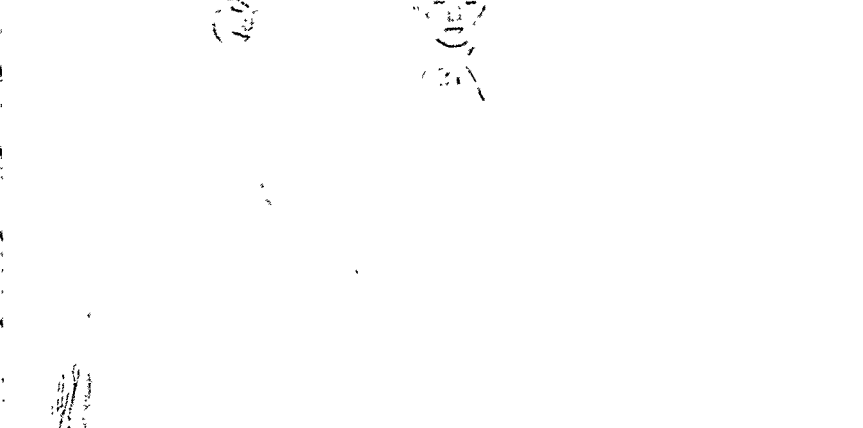
Left: SHORT SKIRTS, LONG SOCKS, and bare knees were adopted by U.S. college girls in 1939

Centre left: EDWARDIAN HAIRDRESS of 1939

Centre right: THE LILLY DACHÉ TURBAN was introduced in the summer of 1939

Lower left: BALenciAGA'S COAT was the most successful coat of autumn, 1939

Lower right: TYPICAL BLACK-OUT FASHIONS of London and Paris, with white hats and accessories



of winter suits were enlarged to form a sort of muff of fur, or material. Many of the winter dresses had fitted bodices, requiring a very slender waist. Beauty salons advertised wasp waist treatments. Mainbocher's sensational new corset, laced up the back, made front page headlines.

Parisian designers had just completed their winter collections, when war burst out in Europe. Under the patronage of the French Government, the fashion industry continued to operate. In London and Paris, blacked out at night against air raids, new fashions began to appear.

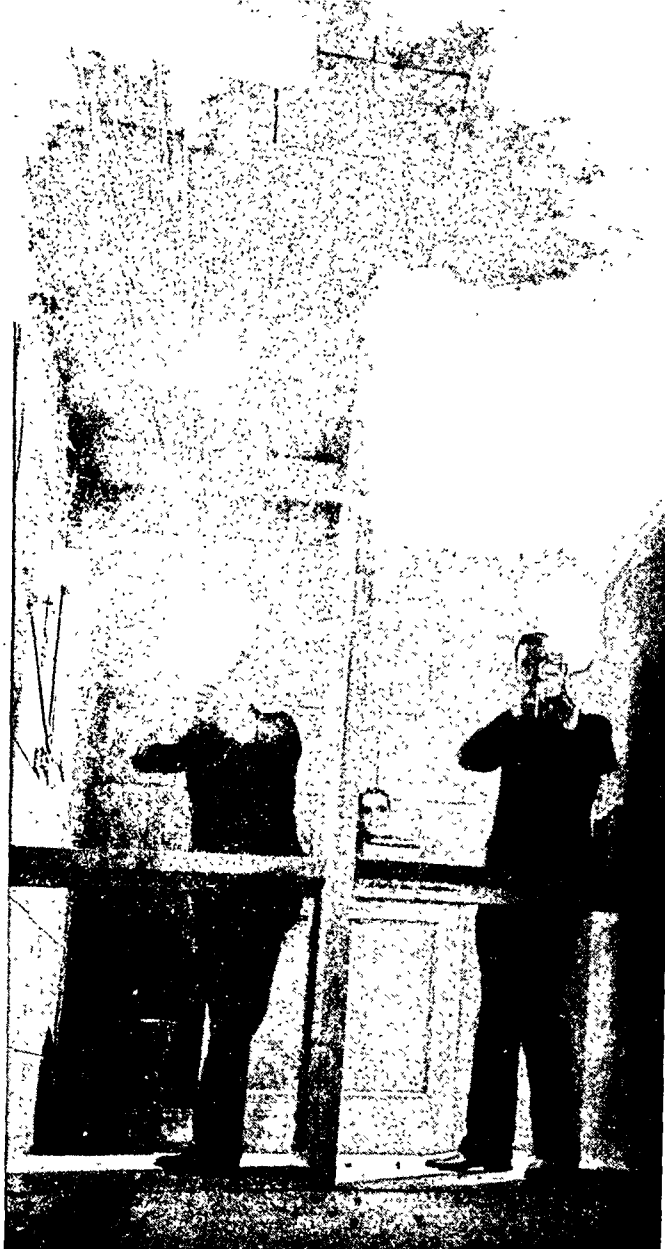
White hats and accessories shone out instead of headlights. Dressy town clothes were replaced by suits, tailored almost like uniforms. Versions of military epaulettes appeared on shoulders. The flashlight became a smart accessory. Containers were designed to cover the inevitable gas mask. The ankle-length dinner dress came in, because of its practicality on emergency nights. And lastly, hats quieted down, were no longer silly, but sensible little toques, serious felts, or wool helmets with scarfs wound under the chin. (See also FURS.) (C. SN.)

Fawcett, George D. (1860-1939), American actor, was born near Fairfax, Va., on August 25 and was educated at the University of Virginia. He made his theatrical debut in *The Maid and the Moonshiner* at New York city in 1886. For many years he appeared in a succession of non-starring roles with Maude Adams, Alexander Salvini, and others. He founded his own stock company at Baltimore in 1900, where he directed and produced a long series of successful plays. In 1909 he appeared as the title character in *The Great John Ganton*. Six years later he had his first role in motion pictures, in *The Majesty of the Law*. During his long and notable film career he was cast with Greta Garbo, John Barrymore, John Gilbert, Joan Crawford, and many other stars. His stage career stood him in good stead after the advent of the "talkies" and he continued playing in such pictures as *The Great Divide*, *Hot for Paris*, and *Ladies of Leisure*. He died at Nantucket, Mass., on June 6.

Fearn, Anne Walter (1867?-1939), American woman physician, was born in Holly Springs, Miss., and graduated in 1893 from the Women's Medical college of Philadelphia. Immediately after receiving her degree she went to China, where she spent the greater part of her life. Her first position was as chief physician in the Women's hospital at Soochow. In 1895 she established a Chinese co-educational medical school, and later she built her own hospital, the Fearn Sanatorium, in Shanghai. She married Dr. John Burrus Fearn, a medical missionary, in 1896. Her autobiography, *My Days of Strength*, was published in the spring of 1939—shortly before her death at Berkeley, Calif., on April 28.

Fechner, Robert (1876-1939), U.S. Gov't official, was born March 22 at Chattanooga, Tenn. After working as a machinist and master mechanic he became identified with labour movements and in 1913 was elected executive officer of the International Association of Machinists. During the World War he was a labour arbiter. President Roosevelt appointed him director of the Civilian Conservation Corps when this agency was established in 1933. During his six years as head of the CCC he directed the activities of approximately 2,000,000 young men. Fechner died December 31 at Washington, D.C.

Federal Bureau of Investigation of the United States Department of Justice is charged with the duty of investigating violations of the laws of the United States, collecting evidence in cases in which



AGENTS of the Federal Bureau of Investigation firing tracer bullets from sub-machine guns on a practice range in Washington, D.C., during the G-men's annual retraining session in July 1939

the United States is or may be a party in interest, and performing other duties imposed upon it by law.

Special agents of the FBI, prior to appointment, must be between the ages of 23 and 35, graduates of recognized law schools, who have been admitted to the bar and had at least two years of legal or business experience, or graduates of recognized accounting schools who have had at least three years of practical commercial accounting or auditing experience. Following appointment, they attend the FBI's training school for 16 weeks before actually being assigned to investigative work. Since the FBI National Police Academy was organized in 1935, it has graduated nearly 400 police instructors, most of whom have inaugurated police training schools upon their return to their local communities.

In the fiscal year of 1939, over 5,100 convictions were secured in cases investigated by special agents of the FBI. During the year 3,982 stolen cars were recovered which were transported in interstate commerce. Since the passage of the Federal Kidnaping Act in 1932, 156 cases of kidnapping and plots to kidnap were reported to the FBI and on July 1, 1939, 154 of the cases had been completely solved. Bank robbery reached its peak in 1932 and following the passage of the Federal Bank Robbery Act in 1934, bank

robberies have declined nearly 80%. In the year 1939 convictions were secured in 96% of the cases brought to trial.

In 1924, the Identification Division of the FBI was founded with a nucleus of 810,000 fingerprint records, and on July 1, 1939, nearly 11,000,000 fingerprint records were on file. Despite this growth it is possible to identify an incoming set of impressions in three minutes. A total of 1,960,299 fingerprint records was received in 1939 as against 1,692,890 in 1938. Nearly 60% of all criminal prints received in 1939 were identified after search through the files. The Civil Identification Section, maintained for the insurance of personal identity of citizens, now numbers nearly 1,500,000 fingerprint records. Of the 5,559 scientific examinations, involving over 39,000 different specimens, made by the Technical Laboratory in 1939, 1,394 were for local authorities. The cost of operating the FBI during the past 15 years was \$52,370,222.08 while savings to the Government, property recoveries, and fines imposed in cases investigated by Bureau Agents totalled almost \$252,000,000. (See also CRIME; CRIME DETECTION; KIDNAPPING; POLICE.) (J. E. H.)

Federal Children's Bureau: see JUVENILE DELINQUENCY.

Federal Communications Commission: see RADIO, INDUSTRIAL ASPECTS OF; TELEVISION.

Federal Council of the Churches of

Christ in America. In 1939 the constituency of the Council comprised 22,188,422 communicant church members, 13 years of age or over, in 22 national denominations. These included most of the major Protestant bodies and one church (the Syrian Antiochian Orthodox) of the Eastern Catholic group. Three of the churches included in the council—the Methodist Episcopal, the Methodist Episcopal South, and the Methodist Protestant—merged into a single body.

A "University Christian Mission" was conducted in 20 educational institutions as a united effort of the churches to bring about a revival of spiritual life. A "Fellowship of Prayer" was promoted throughout the Lenten season. Religious programs were presented over a national radio network at least once every day in the year.

Interdenominational conferences on preparation for marriage and home-making, on the relation of mental hygiene and religious work, on public worship, and on Christian social responsibility were held in local communities throughout the United States.

An international conference was organized at Geneva, Switzerland, on the relation of the churches to the war crisis and on the contribution of the churches to a lasting peace. Programs of assistance for civilian sufferers in China and for Christian refugees from Europe were carried on. An educational effort for interracial co-operation through the churches culminated in the observance of a Race Relations Sunday. *Information Service* was published weekly, presenting analyses of and reports on contemporary social, industrial, educational, and international problems of special interest to the churches. A plan for the unification of all American interdenominational agencies was presented to the churches and a study of greater unity in foreign missions was begun. The officers of the Council were: Rev. George A. Buttrick, president; Dr. John R. Mott, vice-president; Rev. Samuel McCrea Cavert, general secretary. (S. McC. C.)

Federal Home Loan Bank System was created by Act of U.S. Congress on July 22, 1932, to provide reserve credit facilities for the principal thrift and home financing institutions of the United States. It is supervised by the Federal Home Loan Bank Board composed of five members appointed by the President. The struc-

ture consists of 12 regional banks and their member institutions. The regional banks are located in Boston, New York, Pittsburgh, Winston-Salem, Cincinnati, Indianapolis, Chicago, Des Moines, Little Rock, Topeka, Portland and Los Angeles.

Membership is open to lending institutions making long-term loans on homes. The present membership consists of building and loan associations, homestead associations, co-operative banks, savings institutions, and insurance companies. Institutions approved for membership must invest in the capital stock of their respective regional banks. The secretary of the Treasury was also authorized to buy stock, and at present the Government owns approximately 75.3% of the aggregate stock of the regional banks. It is contemplated that eventually all of the stock will be owned by the member institutions. The banks obtain their funds, beyond their capital stock, through the sale of debentures and by accepting deposits from members.

The resources of each bank are used mainly to make advances to members for the purpose of providing additional accommodations to local home owners and investors. Under certain conditions, advances for a short term may be obtained without the deposit of collateral. Long-term advances, which may run up to periods of 10 years, must be secured by approved home mortgages or other acceptable collateral. The Bank System has experienced steady and rapid growth. On Jan. 1, 1933, it had but 101 members with estimated assets of \$217,000,000. By Dec. 31, 1939, membership had increased to 3,920 of which 2,472 were State-chartered home-financing institutions, 1,398 Federal savings and loan associations, 40 insurance companies, and ten savings banks; their estimated assets were \$4,700,000,000. On the same date the paid-in stock of the Bank System amounted to \$165,718,950 and the consolidated assets of the banks came to \$254,680,416. During 1939, institutions which were members of the Bank System made, according to careful estimates, about 38% of the new mortgage loans on urban residential property (houses for from one to four families) made by all private institutional lenders throughout the United States. In addition to their duties arising from the administration of the Bank System and the supervision of Federal savings and loan associations, the Federal Home Loan Bank Board serves as the board of directors of the Home Owners' Loan Corporation and also constitutes the board of trustees of the Federal Savings and Loan Insurance Corporation.

(J. H. FA.)

Federal Housing Administration: see BUILDING AND BUILDING INDUSTRY; HOUSING; SAVINGS BANKS, MUTUAL.

Federal Income Tax: see INCOME TAX.

Federal Land Banks. The 12 Federal land banks operating in the United States since 1917, under the Federal Farm Loan Act of 1916 and subsequent legislation, make long-term first-mortgage loans on farms through 3,700 local co-operative lending institutions known as national farm loan associations. Since 1933 the land banks and the local associations have operated under the supervision of the Farm Credit Administration which also supervises other Federally sponsored co-operative institutions providing short-term production credit and loans to farmers' co-operative business organizations.

Federal land bank loans outstanding on Sept. 30, 1939, aggregating \$1,922,600,000, plus \$703,800,000 of Land Bank Commissioner loans made by the land banks as agents, represented 37% of the total farm mortgage debt of the country. Land Bank Commissioner loans, made on second as well as first mortgage security, were first authorized in 1933 for emergency financing, and can not exceed \$7,500 to any one farmer.

The total capital of the 12 Federal land banks was \$236,521,270 on Sept. 30, 1939, of which slightly less than one-half was owned

by national farm loan associations and individual farmers borrowing directly from the banks. The remaining amount was provided, and is owned by, the United States Government. Funds for making loans are obtained primarily from the sale of farm loan bonds to the investing public. Farm loan bonds aggregating \$1,776,696,040 were outstanding on Sept. 30, 1939.

On Jan. 1, 1940, Federal land bank loans were being made to farmers through national farm loan associations at an interest rate of 4%, which is 1% above the rate at which the last preceding bond issue was sold. The rate of interest is temporarily reduced to all borrowers by Act of Congress.

BIBLIOGRAPHY.—*Farm Credit Quarterly*; Farm Credit Administration *Quarterly Report on Loans and Discounts*; *Annual Report of the Farm Credit Administration*. (E. B. Rn.)

Federal Legislation: see LEGISLATION, FEDERAL.

Federal Power Commission: see PUBLIC UTILITIES.

Federal Reserve System. During 1939, commercial bank reserves in excess of legal requirements rose to unprecedented levels and institutional and other investors also continued to hold a large volume of idle funds. Consequently, money and credit conditions generally remained easy. Prices of Government securities and high-grade corporate bonds, which rose in the first half of the year, declined sharply with the outbreak of war in Europe. Following substantial purchases of United States Government securities in the open market by the Federal Reserve System for the purpose of maintaining orderly conditions in the bond market, bond prices recovered most of their losses. Short-term open-market rates in New York city remained close to the all-time lows.

At the end of November excess reserves of member banks of the Federal Reserve System amounted to nearly \$5,200,000,000. The increase of \$1,700,000,000 during the preceding twelve months was primarily the result of a growth of about \$3,000,000,000 in the country's monetary gold stock, reflecting mostly imports from western Europe. Reserves were also augmented by a decrease of \$400,000,000 in the Treasury cash balances and deposits with the Federal Reserve banks, and by about \$200,000,000 of Treasury silver purchases. The increase in reserves from these sources was offset in part by (a) an increase of \$700,000,000 in the volume of currency in circulation; (b) an increase of \$200,000,000 in foreign bank deposits at Federal Reserve banks; and (c) an increase of nearly \$1,000,000,000 in required reserves in consequence of increased member bank deposit liabilities.

Bank deposits and reserves have been increasing and money rates declining in the United States since the middle of 1933. The Federal Reserve authorities generally followed an active policy of monetary ease from the time of the stock market crash in 1929 to the end of 1933, with interruptions following the departure of England from the gold standard in the autumn of 1931 and at the time of the bank holiday in March 1933.

The System's holdings of Government securities were increased from \$800,000,000 at the beginning of 1932 to \$2,400,000,000 at the end of 1933. As a result, member banks were able to retire practically all of their indebtedness at the Federal Reserve banks, and in addition to accumulate by the end of 1933 about \$800,000,000 in excess reserves. Following the reduction of the gold content of the dollar in Jan. 1934, bank reserves were steadily increased as a result of a heavy flow of gold to the United States. Excess reserves rose by the end of 1935 to over \$3,000,000,000 and continued at close to this level during the first half of 1936.

During 1935, the stock market became increasingly active at advancing prices and customers' borrowings from securities brokers and dealers expanded. In Jan. 1936, the board of governors, acting under the powers granted it by the Securities Exchange Act

of 1934, reduced the amount of credit that brokers and dealers were permitted to extend on securities registered on exchanges. At that time, the loan value for initial extensions of credit was determined by a statutory formula which automatically reduced the loan value as prices increased. The board's action changed the formula so that the loan value of securities that had advanced most in price became 45% of the current market value instead of 55%. In March, again acting under powers contained in the Securities Exchange Act, the board of governors adopted a regulation relating to loans by banks for the purpose of purchasing or carrying registered stocks. This regulation fixed the maximum amount that banks could lend initially on stocks at 45% of the current market value. At the same time, the statutory formula applicable to brokers and dealers was abandoned and the loan value of all registered securities set at 45% of the current market value, thus placing speculators who borrowed from brokers and dealers and those who borrowed from banks on very nearly the same basis. These restrictions had the advantage of providing for control of the use of credit for speculation in securities without limiting the supply or raising the cost of credit for other purposes.

In July 1936, the board of governors of the Federal Reserve System acted to increase reserve requirements of its member banks by 50%, to take effect August 15, and in this way absorbed about \$1,500,000,000 of excess reserves. Again at the end of Jan. 1937 the board announced a second and final action to absorb excess reserves by increasing reserve requirements to the full extent authorized by law. One-half of this increase became effective on March 1 and the remainder on May 1, 1937, still leaving member banks with reserve balances approximately \$900,000,000 in excess of legal requirements.

The board's action on reserve requirements was not for the purpose of restricting the use of credit but rather in the nature of a precautionary measure to prevent an injurious credit expansion in the future. The board emphasized at the time that the easy money policy pursued by the Reserve System since the beginning of the depression would continue in effect, and that the increases in reserve requirements were intended only to bring the country's credit machinery within the Reserve System's control.

In Dec. 1936, the United States Treasury, after consultation with the board of governors, adopted a policy of placing additions to the gold stock in an inactive account so that member bank reserves were no longer subject to expansion from this source.

Subsequent actions by the Reserve System and the Treasury in 1937 and 1938 as well as in 1939 implemented the policy of monetary ease. The first of these actions by the Reserve System was in connection with unsettlement of the bond market in the spring of 1937. At the turn of the year 1936-37 the previous prolonged advance in high-grade bond prices ceased, and early in 1937 there was a decline. Banks and other investors with substantial paper profits on their bond holdings began to sell in order to realize these gains. Disorderly conditions in the long-term bond market led the System to purchase Government securities of longer maturities and to dispose of securities of shorter maturities, without changing the total holdings in the System's open-market account. This was followed in early spring by the outright purchase of approximately \$95,000,000 of Government securities in the open market, which were added to the account. Conditions in the bond market became steady in April and the decline in Government security prices ceased.

By the late summer of 1937, prices of stocks and of basic commodities declined sharply and evidences of weaknesses in the business situation were becoming increasingly apparent. Therefore, during August and the early days of September, the Federal Reserve banks reduced their discount rates, bringing the rate at the Federal Reserve Bank of New York to 1%, the lowest central bank

rate in history, and at the other Federal Reserve banks to $1\frac{1}{2}\%$. The board also issued in Sept. 1937 a revised and liberalized regulation relating to advances and discounts by Federal Reserve banks for member banks, in accordance with changes in the law made by the Banking Act of 1935.

In Sept. 1937, at the request of the board of governors, the Treasury released \$300,000,000 of gold from its inactive account and at the same time the Reserve System announced that it would be prepared to buy additional Government securities in order that seasonal demands for currency and credit might not have the effect of tightening credit conditions. The release of gold was made by the Treasury about the middle of September and as the proceeds were immediately expended, excess reserves were increased to over \$1,000,000,000 again, and have remained substantially above that figure ever since. In November the System increased its holdings of Government securities by about \$38,000,000.

Effective Nov. 1, 1937, the board of governors increased the amount of credit that both banks and brokers were permitted initially to extend on securities from 45% to 60% of their current market value.

In Feb. 1938, the Treasury modified its gold policy by providing that from Jan. 1, 1938, gold acquisitions up to \$100,000,000 in any one quarter of the calendar year would be incorporated in the monetary system, and that only the excess above this amount should be placed in the inactive account. In April the Treasury discontinued the inactive gold account entirely and deposited with the Federal Reserve banks approximately \$1,400,000,000 of gold certificates and in this way "deteriorated" the gold previously held in the inactive account. At the same time, the board of governors reduced member bank reserve requirements by about one-eighth, or approximately \$750,000,000.

In the early summer of 1939, the System allowed its holdings of short-term Treasury bills to decline by about \$140,000,000 by not replacing bills as they matured. This action was in response to technical conditions in the bill market, where rates had declined to practically a no-yield basis, and did not mark a change in general credit policy.

With the outbreak of war in Europe in early September, long-term Government bonds declined sharply. From August 30 to September 20 the Federal Reserve System increased its open-market holdings by \$400,000,000 and on September 1 the Board of Governors announced that in view of developments in the international situation, the Federal Reserve banks were prepared to make advances to nonmember banks on Government obligations at par, on the same terms as are accorded member banks. Discount rates on advances secured by Government obligations were reduced by a number of Federal Reserve banks. With firmer conditions restored in the bond market, the System again allowed its holdings of Treasury bills to run off and sold some of its notes and bonds, with the result that by the end of November the System's total holdings of United States Government obligations had declined by nearly \$300,000,000 from the peak in September and were smaller than they had been in the early part of the year.

Although the war, if prolonged, will profoundly affect many aspects of our economy, its outbreak produced no repercussions on this side of the Atlantic comparable to those of 1914, when the stock exchange and many commodity exchanges were forced to close. At that time, heavy withdrawals of currency and gold forced banks to operate on a restricted basis, while business generally suffered a sharp decline in activity. In contrast, during recent months all exchanges have remained open, bank deposits and reserves have increased, while commodity prices and business activity generally have advanced to near post-depression highs.

In view of the present volume of excess bank reserves, which is

larger than ever before, and of other idle funds in the hands of investors, the outlook is for the continuance of extremely easy money conditions. While there is no immediate prospect of an inflationary expansion of credit, from a long-term point of view the existing large volume of excess reserves, which shows no prospects of diminishing in the period immediately ahead, provides the basis for a potential expansion in credit and constitutes a possible threat to future economic stability. Should circumstances arise which might precipitate such an injurious expansion, the Federal Reserve authorities would need additional powers to deal with the situation. (See also BANKING.) (M. S. E.)

Federal Surplus Commodity Corporation: see BUTTER.

Federated Malay States, area 27,540 sq.mi., population (1938) 2,089,835, are one of the three main subdivisions of British Malaya, the others being the Straits Settlements and the Unfederated Malay States (*qq.v.*). There are four Federated Malay States, Perak, Selangor, Negri Sembilan and Pahang, of which the first three are on the west coast of the Malay Peninsula, while Pahang is on the east coast. Each State is administered under the advice of a resident, who is subject to the instructions of the High Commissioner, who is also governor of the Straits Settlements. Present governor: Sir Thomas Shenton Whitelegge Thomas. The seat of the Federal Government is at Kuala Lumpur (Selangor), the largest town in the States, with a population of 127,124. The Federated Malay States contain 1,068mi. of railway and 2,916mi. of metalled roads. They constitute the immediate hinterland of the two main ports of the Straits Settlements, Singapore and Penang, and are rich in minerals and raw materials, especially tin and rubber. Other important products are coco-nuts, oil palms, rice and pineapples; and there are deposits of coal and gold. Chinese labour is largely employed in the tin mines and there are many Indian workers on the rubber plantations. The Malays devote themselves more to hunting, fishing and agriculture. The area under rubber amounts to 1,625,000 acres. The mines of the States in 1937 produced 75,393 tons of tin, 33,828oz. of gold, 863 tons of tungsten and 627,890 tons of coal. Imports were £11,272,459 in 1936 and £15,281,295 in 1937. Exports were £28,611,747 in 1936 and £41,500,942 in 1937. The revenue of the States in 1937 was £9,434,202. (W. H. CH.)

Federation of Labor, American: see AMERICAN FEDERATION OF LABOR.

Feldspar. Almost the entire commercial utilization of the feldspars is in the ceramic and glass industries. The United States is the world's largest producer and consumer, followed by Sweden, China and Norway, with a number of minor producers. World production is of the order of 400,000 to 450,000 metric tons, of which the United States contributes nearly two-thirds. The 1938 consumption in the United States was 214,514 short tons, 4% of which was imported from Canada, about 55% in glass, 34% in pottery, 9% in enamel and sanitary ware, leaving 2% for miscellaneous uses, most of which are of a ceramic character. (G. A. Ro.)

Fencing. Loyal Tingley, an undergraduate at the University of Chicago, fought to a victorious finish in the National A.A.U. championship at the San Francisco Golden Gate Exposition. He dethroned José R. de Capriles, the 1938 épée champion, in masterful style.

Another young collegian, Normie Lewis, wearing the colours of the Salle Santelli, of New York, earned premier honours with the foil over Dernell Every, of the New York A.C. Only one seasoned

contender—Norman Armitage, of the Fencers Club, of New York—bested the veteran, Dr. John R. Huffman, the defending sabre champion, of the N.Y.A.C. Team honours were scattered: Foil, Salle Santelli; épée, Fencers Club; sabre, N.Y.A.C.

Outdoors, the national championship titles fell to José R. de Capriles in the three-weapon competition; Armitage took the sabre title, and Tracy Jaeckle, of the Fencers Club, captured the épée title. The three-weapon team crown was won by the Santelli fencers. Miss Helene Mayer, of Oakland, Calif., who caused a furor when the Nazis refused her entry in the 1939 Olympics in Berlin because of being a Jewess, and then turned right about, won her fifth national championship fencing title. In the Intercollegiate Fencing Association championships Army and Navy ruled in typical style. Vincent De Poix, of the U.S. Naval Academy, won the foils; Salvatore Manzo, of the U.S. Military Academy, captured the épée title; Abraham Campo, of Navy, was the best with the sabre. Navy took the foil, épée and three-weapon team titles, and Columbia salvaged the sabre team crown.

(J. B. P.)

Fernando Pó: see SPANISH COLONIAL EMPIRE.

Fertilizers. European wars are materially affecting the world production and consumption of fertilizer materials.

In the United States, Government competition with private industry continues through the manufacture of concentrated superphosphate by the Tennessee Valley Authority.

World consumption of nitrogen in fertilizers reached 2,492,000 tons in the year ended June 30, 1938, the highest on record. Other plant food consumption was also on the increase. The onset of war in Europe in the late summer of 1939, with its blockades and munitions requirements, changed the picture. Nitrogen, the basis of most explosives, was requisitioned in large quantities for that use. Its use on the land in warring countries was severely rationed. Land use of potash and phosphates was also regulated. Potash produced in Germany came under the ban of the British blockade. Shipping for French-produced potash was difficult to obtain. American-produced potash was kept for domestic consumption. Phosphates from North Africa and America were barred from Germany by the blockade and their transportation was difficult for other nations.

Reduction in man power for agriculture resulted from mobilization in nearly all European countries. This combined with the necessity for increased food production for the augmented armies of the world, demanded maximum acre production. Increased consumption of fertilizers in belligerent nations was thus desirable, but in many cases impossible, because of scarcity of supply.

World resources of plant food are now known to be much greater than were believed to exist during the World War (1914-18). Fixation of atmospheric nitrogen provides inexhaustible supplies of that element. Discovery of additional deposits of potash outside Germany and of many large deposits of phosphate in various countries has greatly increased the known sources.

(C. J. Br.)

Fibreglas: see CHEMISTRY, APPLIED; INDUSTRIAL RESEARCH.

Fiction: see AMERICAN LITERATURE; CANADIAN LITERATURE; DUTCH LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; ITALIAN LITERATURE; SPANISH-AMERICAN LITERATURE.

Fiji: see PACIFIC ISLANDS, BRITISH.

Financial Review. Up to the outbreak of war in Europe, financial and general business conditions throughout the world were, at least on the surface, generally satisfactory. World industrial production, which by the end of 1938 had recovered a major portion of the decline sus-

tained in the 1937-38 depression, remained at a comparatively high level. Exclusive of the United States, world industrial production reached new high records in the second quarter.

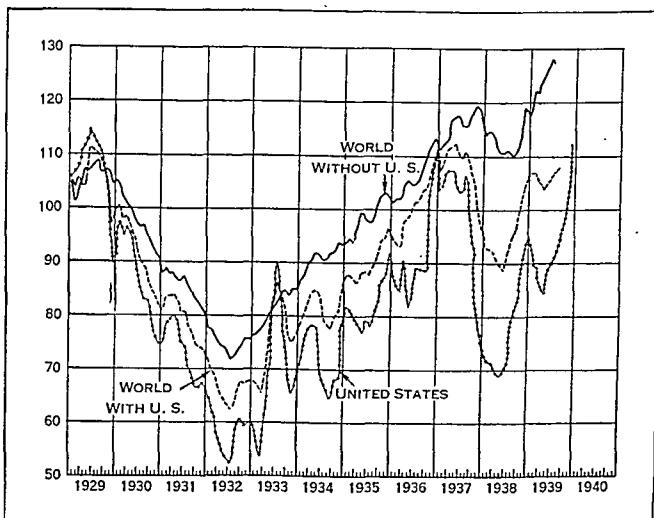
In the United States, recovery from the 1937-38 depression was interrupted by a recession lasting from Dec. 1938, until May 1939. Thereafter there was an expansion of industrial production to a level at which nearly all of the recession had been recovered.

In England, the trend of industrial production was governed largely by preparations for war. Consequently, industrial production rose gradually but continuously up to the time of the declaration of war on Germany. In France, the influence of preparation for war was even more pronounced. France had experimented with the practical application of certain socialistic doctrines, to the visible detriment of her internal prosperity and capacity to produce. With the peril of hostilities approaching, France threw overboard these restrictions and went heartily and unitedly to work on armament, whereby the index of industrial production for France, up to the outbreak of the war, showed the steepest rise of that of any European country.

Industrial production in Germany reached a new high record in the first quarter. Thereafter, however, despite territorial expansion, the German industrial machine was unable to increase the output of goods, which is a rather remarkable commentary on the National Socialist economic system in view of the increasing need for war materials to support Hitler's defiance of other countries. A similar fate seemed to befall Japan. Although industrial output reached a new high record, the rate of increase, as the year progressed, became small, despite Japan's territorial expansion and her reluctance to end her military adventures.

On the whole, however, the year, up to the outbreak of war, was a period of increasing industrial activity throughout the world, in the smaller as well as the larger countries. Poland, for example, reported a new high record in industrial activity a few months prior to the German invasion.

Notwithstanding this apparently favourable statistical situation, the financial situation in the United States, even before the peace was finally shattered, was not considered especially satisfactory. The business recession of the first and second quarters was of course a factor in depressing financial sentiment, but it was not the main factor. The main factor was a recurrence of European crises. The Munich crisis of Sept. 1938, had taken a heavy toll in Wall Street, but the Czech crisis in March 1939, proved to have an even more depressing effect, and stock prices declined to the lowest level since June 1938. Throughout this



INDUSTRIAL PRODUCTION, U.S. and World: 1928=100; adjusted for seasonal variation (The Annalist)

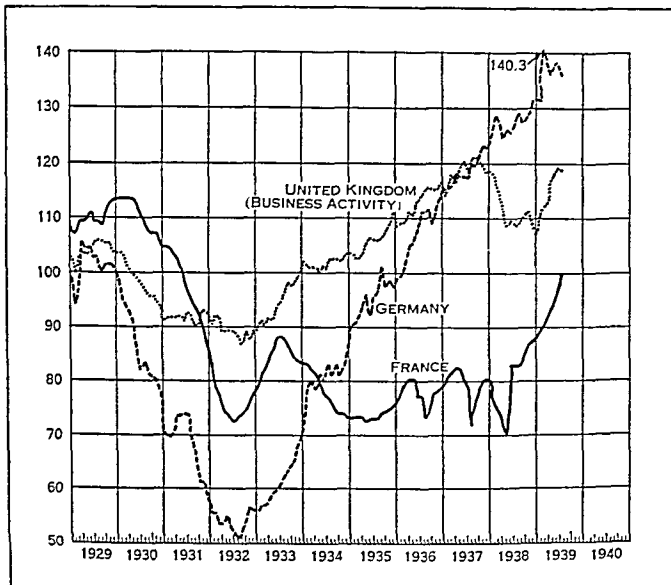
period, American stock prices proved particularly vulnerable to events abroad; at times, indeed, stock prices in New York were weaker than in London. Investors were apprehensive that war would touch off heavy foreign selling of American securities.

The visible improvement in industry and trade, and the accompanying firmness in raw material prices, which characterized the period from May to August, was reflected in a moderate rise in the stock market; but the feebleness of this movement is emphasized by the fact that at the end of July, when the rise culminated, the level of stock prices was some 12% lower than the best level reached in 1938, although the business outlook was becoming increasingly favourable.

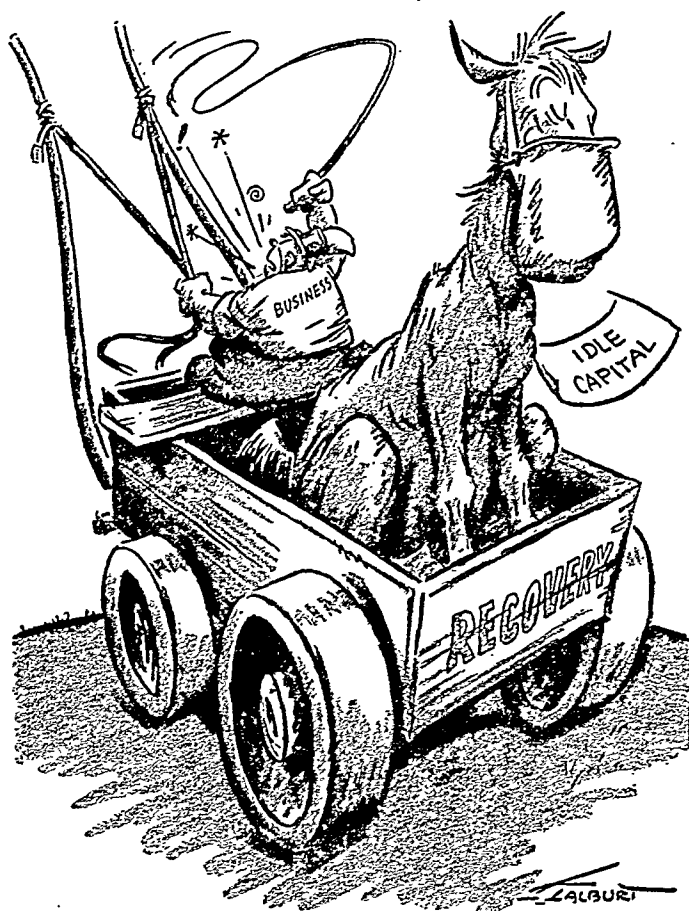
From early July to the end of August the financial markets were dominated by the implications of the darkening war clouds over Europe. Based largely on the sequence of events upon the outbreak of the World War in 1914, the prevailing view on the probable consequences of the outbreak of another war was one of pronounced gloom. The New York Stock Exchange, the Securities and Exchange Commission and Washington officialdom had already, in April, drawn elaborate plans for meeting what was expected to be a major calamity, in the event of an actual outbreak of hostilities. *The Annalist* average of 90 stocks declined from a high of 49.0 on July 18, 22 and 25, to a low of 41.0 on September 1. General business activity, which had revived considerably in June, failed to expand further.

The German invasion of Poland and the declarations of war by England and France, however, furnished one of the greatest surprises in modern financial history. Instead of declining, as on the occasion of the outbreak of war in 1914, stock prices rose sharply. Raw material prices soared. There was a severe decline in high grade bond prices, including United States Government bonds. Business activity expanded rapidly as orders poured in to manufacturers from consumers who became alarmed over the danger that the demand for goods for armament purposes would create a shortage of available supplies. The railroads experienced one of the sharpest upturns in traffic in their history. For a few days there was an actual shortage of freight cars.

The extent of this buying movement may be judged from the fact that the National Industrial Conference Board's index of new orders received by manufacturers rose from 90 in July and 96 in August to 164 in September. *The New York Times* weekly business index advanced from 92.3 for the week ended August 26 to 102.0 for the week ended September 30.



INDUSTRIAL PRODUCTION, Europe: 1928=100



"GIDDYAP." The problem of idle capital in 1939, neatly illustrated by Talburt of *The New York World Telegram*

The Bureau of Labor Statistics wholesale commodity price index advanced from 74.8 to 79.5 in the same interval. Its index of raw material prices advanced from 66.2 to 73.1; of semi-manufactured goods prices from 74.4 to 83.7. *The Annalist's* index of cyclical industrial raw material prices, which is composed of items peculiarly sensitive to changes in the demand for raw materials entering into the manufacture of producers' durable and semi-durable goods, advanced from 63.6 to 84.2. A tremendous wave of buying swept the markets for steel, the nonferrous metals, and textiles. Orders for some items of railroad equipment reached the highest totals in 16 years.

One of the most curious aspects of this sequence of events was the circumstance that many usually well-informed economists and statisticians, even up to the middle of August, had refused to concede the probability of a major European conflict. For that reason, in the belief that war if it did come would cause a severe decline in stock prices, they had not recommended the sale of stocks. Consequently those economists and statisticians who were dead wrong on war prospects were dead right on stock market prospects, whereas those who correctly forecast the outbreak of war were, in general, wrong on the market outlook.

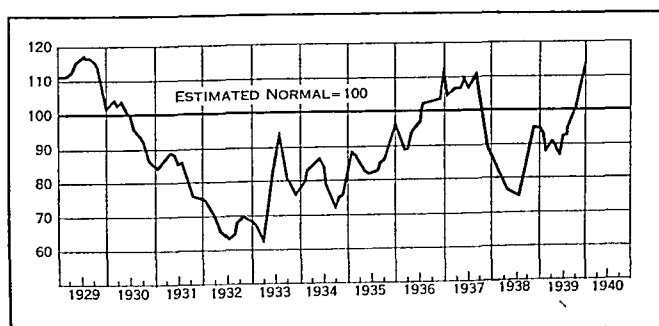
This curious situation, however, was soon to be reversed by another surprising development. Just as investors and speculators had adjusted themselves to the probability of an immediate war boom of greater or less intensity, partly in the belief that the arms embargo section of the Neutrality Act would be repealed, the boom in the stock market subsided. The boom lasted only until September 13; and the stock averages not only failed to reach the Nov. 1938 top, but failed by a narrow margin to establish a new high record for 1939. Thereafter, stock prices, except for a moderate advance in aviation stocks, moved horizontally until October 26, when an extremely gradual decline began which lasted until

the end of 1939.

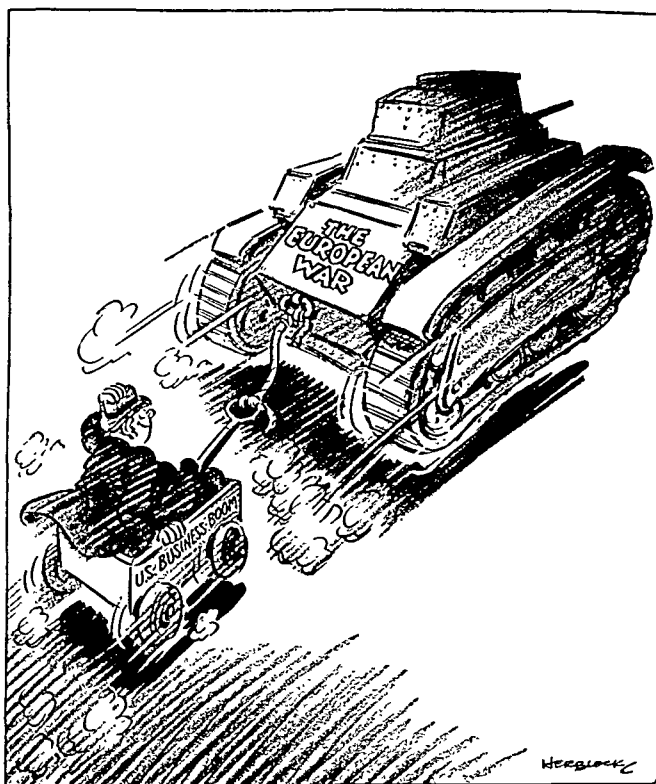
The failure of stock prices to advance in the last quarter was the third major surprise of the year to experienced financial observers, because business activity continued to expand until the middle of November and thereafter held at the advanced level until the end of the year. In the past there had been many occasions on which stock prices had failed to advance parallel with important advances in business activity; but never in the financial history of the country had there been such a pronounced divergence. In the past, the divergencies could be attributed to extraneous influences, such as changes in the level of interest rates. But in the fourth quarter of 1939, after the subsidence of the first shock of the war, the money market eased almost as rapidly as it had tightened; so that by the end of 1939 Treasury bonds were selling almost as high as in May, when they sold at the highest prices in the history of the country; and high-grade utility and industrial bonds had recovered practically all their September declines.

The failure of stock prices to advance was considered all the more remarkable in view of the circumstance that the volume of industrial production, as measured by the Federal Reserve Board's index, in November reached 124, which was only one point lower than the all time high record established in 1929. Steel ingot production, adjusted for seasonal variation, increased to a new high record for all time in October. The demand for some of the leading raw materials of industry, such as the nonferrous metals, cotton, hides and leather, and rubber, reached exceptionally large proportions. Unfilled orders for steel, textiles, and other important commodities at the end of the year were generally believed in informed financial quarters to be sufficient virtually to guarantee a high rate of general business activity well into 1940.

Financial sentiment remained depressed despite these favourable indications. Foreign selling of American securities was at no time exceptionally heavy, but it persisted in considerable volume, generally estimated at from 5 to 10% of total volume; and it represented, of course, one-way traffic, with little or no offsetting foreign purchases. There were persistent peace rumours, which Wall street interpreted as bullish from a long-range standpoint but bearish on the immediate outlook. Except for substantial orders for aircraft, motor trucks, and a number of items of technical apparatus coming under the head of munitions, the volume of so-called war orders was less than had been expected when the arms embargo was repealed. The Allied commissions charged with the duty of procuring supplies in the United States proceeded with exasperating deliberation. The fact that the Allies were prohibited by the Johnson Act from borrowing in the United States made it necessary for them to follow a policy of extreme caution in order to conserve available purchasing power. The initial successes of the German naval campaign disrupted shipping schedules and for a time raised cargo insurance rates to almost prohibitive levels.



BUSINESS ACTIVITY in the United States: Annalist composite monthly index



"OF COURSE, IT'S A LITTLE DANGEROUS." Herblock of NEA Service pictures the U. S. war boom which began in Sept. 1939

Shipping difficulties were intensified by the so-called cash-and-carry provisions of the Neutrality Act as amended by the special session of Congress. Investment buying of securities was restrained by the recollection that during the World War (1914-18) stocks had sold at comparatively low price-earnings ratios.

Some prominent industrialists who were opposed to the New Deal said that the industrial boom was unsound and could not last. Some prominent New Dealers said the same thing; and whereas throughout the early years of the New Deal every effort was made to promote rising commodity prices, throughout the early days of the war the New Dealers, both as individuals and through various agencies such as the Temporary National Economic Committee, said that drastic steps would be taken if necessary to prevent "profiteering." Fear of such measures was believed to have been an important factor in the decision of the steel companies not to advance finished steel prices, although there had been sharp increases in their operating costs owing to higher scrap prices and high wage rates. All this proved confusing to investors, who also feared the imposition of heavy "war-profits" taxes if the boom continued. Finally, the character of the war itself, involving almost no activity on the Western Front, was such as to deter investors from making commitments. New financing, except for some refunding, remained dormant, as it had been throughout the year.

There was considerable apprehension both in financial and governmental circles lest the industrial boom, because it was touched off by a sharp rise in raw material prices, would lead to a repetition of the 1937 collapse when inventories became glutted through over-enthusiastic anticipation of an endless chain of price increases. Statistics compiled by the National Industrial Conference Board, however, showed that up to the end of October no undue accumulation of inventories had occurred.

Part of the uncertainty over the outlook was attributable, in all probability, to the fact that the improvement in business activity was most pronounced in the heavy industries and in those

associated during the World War with war orders. As the year drew to a close, however, it was seen that this was probably a normal development; that the expansion in other sectors of the national economy would eventually follow and round out the picture. Hence, although there had been considerable comment to the effect that production was outrunning consumption, retail trade spurted in November, after about the usual lag behind industrial production. Employment and payrolls also increased rapidly, although with a customary lag behind the rise in industrial production. There were some increases in wage rates, making them the highest, on the average, in the history of the country. Some manufacturers with heavy backlogs of unfilled orders gave wage increases to forestall labour trouble, in the belief that the cost of living would increase and create renewed demands for higher wages. The cost of living rose in September, but moderately; and later developments showed that expectations of a perpendicular rise in retail prices, similar to the one that occurred in the World War (1914-18), had, for the time being, been falsified.

The labour situation improved, by and large. The worst strike was one against the Chrysler Corporation, which lasted several weeks and interfered seriously with the production and marketing of 1940 Chrysler products. Except for the strike, total automobile production, seasonally adjusted, would probably have reached a new all-time high record in November. Automobile sales remained brisk, for the season, to the end of 1939. The fact that there was such heavy demand for automobiles and other consumers' durable goods, and for commodities remotely connected with the changed situation brought about by the war, seemed in considerable measure to diminish the force of the argument that the industrial boom was temporary. It seemed, on the contrary, to strengthen the argument that industrial recovery in the United States was already well under way when the war broke out, and that the outbreak of war merely accelerated the recovery.

This acceleration, moreover, was widespread. It affected the agrarian as well as the industrial areas. Wheat prices advanced sharply on the outbreak of war. Subsequently, when there was general realization of the seriousness of drought conditions in the wheat belt, wheat futures at Chicago sold above \$1 per bushel for the first time since 1937. Cotton prices and other farm products, with the notable exception of cattle and hogs, advanced. Cash farm income, which had remained at the moderate 1938 level through the summer, increased in September and October.

With Europe at war, economic statistics for the latter part of the year were not available. There were indications, however, that the German industrial machine was standing the war strain none too well. Although the strain of financing another war on top of the unliquidated debts from the last war was a heavy burden for England and France, the necessary steps both for increased taxation and additional borrowing proceeded in an unexpectedly orderly, systematic and determined manner. The pound sterling declined from about \$4.48 on August 24 to \$3.73 on September 15, then recovered to about \$3.95. The French franc declined from about 2.65¢ to 2.10¢, then recovered to about 2.24¢. Dollar exchange rates on leading neutral countries remained remarkably steady. Although American exports to Germany reached the vanishing point, there were indications that some neutrals were transshipping American and other exports to Germany, as happened in the World War. American exports to all countries increased sharply in September and October but declined in November. American exports to South America increased sharply. Steps were being taken toward the end of the year by Government officials to finance increased trade with South America, although some observers in the financial districts believed that trade opportunities there were being exaggerated.

National debts again increased in all major countries. The net

debt of the United States increased at an unprecedented peacetime rate, despite increased business activity which relieved the Treasury of some of the unemployment relief burden. Declining work relief and public works expenditures were more than offset by sharply increased expenditures for farm benefits and for national defence. There were rumours that the President would make an attempt to balance the budget, or come closer to a balance, in fiscal 1941; but nobody seemed to take the rumours very seriously. (See also CANADA; COST OF LIVING; EXCHANGE RATES; EXCHANGE STABILIZATION FUNDS; EXPORTS AND IMPORTS; GOLD RESERVES AND GOLD STANDARD; INTERNATIONAL TRADE.)

(D. W. E.)

Finck, Herman (1872-1939), British composer, was born in London on November 4. After studying music at the Guildhall school, he became a pianist and violinist at the Palace theatre, where he was musical director from 1900 to 1921. From 1922 to 1931 he was musical director of the Theatre Royal, Drury Lane. A prolific worker, Finck wrote the music for dozens of revues, comic operas and operettas. His compositions included also many pieces of incidental music, overtures and songs. He died in London April 21.

Finland. Area (including inland waters) 147,811 sq.mi.; pop. (est. Dec. 31, 1938) 3,863,756. Chief towns (pop. est. Dec. 31, 1938): Helsinki (cap. 304,965); Viipuri (74,247); Turku (74,315); Tampere (76,730). President: Kyösti Kallio; language: Finnish (Swedish 10%); religion: Lutheran Christian.

History.—The advent of 1939 was received in a spirit of optimism tempered with circumspection. Though Munich had failed to bring about real appeasement, yet leading political circles in Finland were disinclined to countenance the view that Hitler was bound to force the issue. The ten years' non-aggression pact between Finland and Russia, signed in 1934, had yet another five years to run, and so Finland felt justified in pushing on with the preparations for the Olympic games, which were to take place in Helsinki in the summer of 1940.

As the year wore on, however, anxieties deepened, notably since it became known that Russia had put forward far-reaching territorial claims on Finland as part of her reward for signing the Anglo-Russian pact for which negotiations were proceeding; and all through the summer a number of precautionary military measures were carried out in order that events should not take Finland entirely by surprise. The Finnish cabinet was in the main the same as had assumed office on March 13, 1937—essentially a coalition of the parties of the left, with M. Cajander (Progressive) as prime minister and M. Tanner (Socialist) as minister of finance. The portfolio of foreign affairs had been taken over by M. Erkko (Progressive) in succession to M. Holsti.

On the outbreak of the war between the Allied Powers and Germany, Finland like the other Scandinavian states immediately declared her strict neutrality. Russia, having first invaded Poland and next established a complete dominance over the three small Baltic republics, Estonia, Latvia and Lithuania, shortly afterwards issued (October 5) an ominous invitation to Finland to send a delegation to Moscow for the purpose of discussing certain political questions affecting the two countries. Finland accepted the invitation, and sent as her chief delegate, Dr. Paasikivi, Finnish minister at Stockholm, and one of the architects of the peace concluded between Finland and Russia in 1920, adding to the delegation later M. Tanner, the Socialist minister of finance.

Russia's proposals were communicated to Finland on October 14. They included the demand for a 30 years' lease to Russia by Finland of the port of Hangö in south-west Finland, and a territory adjoining thereto, to be used as a naval base, Russia being also entitled to keep at Hangö a garrison not exceeding 5,000 men

in number. Finland was further to cede to Russia certain islands in the Gulf of Finland—Hogland (Suusaari), Seiskari, Lavansaari, Tytärsaari, and Björkö (Koivisto); part of the isthmus of Karelia, from the village of Lippola to the southern border of the village of Björkö, and, in the extreme north of Finland, in the district of Petsamo, the western part of the Fishermen's peninsula, on the Arctic ocean, in all some 2,761 square kilometres. In exchange, Finland was to receive from Russia, territories to the north of Lake Ladoga, in the districts of Repola and Porajärvi, totalling 5,529 square kilometres. Apart from these territorial questions, the existing non-aggression pact between Finland and Russia was to be supplemented by a clause binding the two contracting parties not to join any groups or alliances directly or indirectly hostile to either of the contracting parties. Moreover, the fortified zones on both sides of the Finno-Russian frontier were to be suppressed; and finally Russia declared her willingness to allow Finland to fortify the Aaland islands by herself, no foreign power (including Sweden) being entitled to a share in this work.

These demands were carefully examined by the Finnish Government which on October 23 presented counter proposals to Moscow. These were marked by a very conciliatory spirit. They provided for the cession to Russia of most of the islands in the Gulf of Finland claimed by her; for an adjustment of the frontier on the Isthmus of Karelia—against compensation in both cases; and met the suggestion regarding the supplementing of the non-aggression pact in a sympathetic spirit. Only as regards the Russian demand for the port of Hangö was Finland constrained to return a negative answer, since a cession of this particular portion of her territory would be incompatible with Finland's neutrality.

After this first exchange of proposals, negotiations were continued for about three weeks, various alternatives being explored. Agreement proved, however, impossible to attain, and on November 13 the Finnish delegates left Moscow, expressing the hope that future negotiations might be continued with a result satisfactory to both parties. The Soviet press and wireless now launched a violent campaign against Finland; and on November 26 it was alleged that Finnish artillery had fired on Soviet troops stationed in the vicinity of the village of Mainila on the Karelian isthmus. Finland had no difficulty in refuting this allegation, but proposed that the matter should be investigated jointly by Finland and Russia and that meanwhile both powers should withdraw their troops from the frontier. This was countered by a unilateral denunciation, on the part of Russia (November 28) of the existing non-aggression pact, in clear defiance of the procedure laid down

in the pact in question. In spite of this rebuff, Finland persisted in her conciliatory attitude, making (November 29) various proposals (including one for neutral arbitration) aiming at a peaceful settlement of the difference which had arisen. Before the Finnish minister in Moscow had been able to transmit the proposals to the Russian Government, the latter had, however, on the same day, November 29, broken off diplomatic relations with Finland. The Finnish representative found, nevertheless, means of conveying the proposals of his Government to the Commissariat of Foreign Affairs in Moscow, in the early hours of November 30. It was, therefore, with full cognizance of Finland's willingness to investigate, that Russia, without an ultimatum, without a declaration of war, attacked Finland by air, sea, and land late in the day on November 30. The capital of Finland and many other localities were subjected to a ruthless bombardment from the air. On this very day the Government of the United States of America offered their good offices for a peaceful settlement of the conflict; Finland, although the aggrieved party, gratefully accepted the offer, whereas Russia rejected it. On December 1, the day after the invasion, the Finnish Government was reconstructed as a Cabinet of National Union, all parties being represented in it: M. Cajander was succeeded as prime minister by M. Ryti, governor of the Bank of Finland, and M. Tanner, the former minister of finance, took over the portfolio of foreign affairs. Already the day before, Finland's national hero from her war of independence in 1918, Field Marshal Mannerheim, had been appointed commander-in-chief of the Finnish Army.

Meanwhile, in these crowded days a characteristic manoeuvre had been performed by the Soviet Government. No sooner had Russia invaded Finland, than she gave it out to the world that a "People's Government of Finland" had been set up in the Finnish bathing resort of Terijoki, close to the Russian border. This puppet government consisted wholly of exiled Finnish communists; at its head was Otto Kuusinen, notorious as one of the signatories to the famous Zinoviev letter, addressed in 1924 to the Central Committee of the British Communist Party. This "government" hastened to grant Russia all she asked for in Finland; and when on December 4 the Swedish minister to Russia transmitted to Moscow fresh proposals for negotiations, emanating from the legal Finnish Government, he was told that the only Finnish Government hereafter recognized by Russia would be the puppet cabinet of Terijoki. (See EUROPEAN WAR.)

The indignation, felt all the civilized world over at the brutal aggression against Finland, found striking expression in the action of the League of Nations. Finland having appealed to the League for assistance, the Council of the League, sitting at Geneva, voted the expulsion of Russia from the League of Nations on December 14. On this occasion, both the British and the French representatives announced the intention of their Governments to extend every possible help to Finland. Large amounts of money destined to help Finland were raised by public subscription in Scandinavia, in Great Britain, and in the United States.

The end of 1939 saw the Russian onslaught stemmed by the Finnish Army with remarkable success. The vital system of defence across the Karelian isthmus, known as the Mannerheim Line, had been at no point penetrated by the Russian forces; to the north of Lake Ladoga, the Finnish troops had not only repulsed the Russian attacks but had crossed into Russian territory; and still further north, the fight was continuing in a manner which augured well for Finland's power of resistance. Everywhere, the Russian losses, both of men and of war material, had been considerable; and the repeated air raids on the cities of Finland had entirely failed to break the spirit of the Finnish people. (T. Bs.)

Education 1937-38:—Elementary schools 11,565; scholars 407,146; secondary schools 218; scholars 52,296.

BARON CARL GUSTAV MANNERHEIM, chief of Finland's defence forces, met frequently with his council late in 1939 as his nation mobilized for an invasion by Russia



Banking and Finance.—Revenue, ordinary (est. 1939) 4,502,200,000 markka; expenditure, ordinary (est. 1939) 3,475,900,000 markka; public debt (Dec. 31, 1938) 3,673,500,000 markka; note circulation (Aug. 31, 1939) 2,262,000,000 markka; gold reserve (Aug. 31, 1939) 1,183,000,000 markka; exchange rate (up to Aug. 26, 1939): 226½–227 markka=£1 sterling.

Trade and Communication.—External trade in 1938 (merchandise): imports 8,607,300,000 markka; (Jan.–Aug. 1939) 5,480,700,000 markka; exports 8,398,000,000 markka; (Jan.–Aug. 1939) 5,759,600,000 markka. Communications: roads, State (1938) 20,235mi.; railways, State (1938) 3,670mi.; shipping (June 30, 1939) 626,000 gross tons; motor vehicles licensed (July 31, 1939): cars 29,675; commercial vehicles 22,860; cycles 7,677; wireless receiving set licences (1938) 293,896; number of telephone subscribers (1938) 7,720.

Agriculture, Manufactures, Minerals.—Production 1938 (in metric tons): wood pulp 2,110,000; oats 826,000; (1939) 798,000; rye 369,000; (1939) 331,000; wheat 256,000; (1939) 227,000; barley 207,000; (1939) 192,000; potatoes 1,198,000; copper 12,600; butter, creamery 33,000; beet sugar 13,600; superphosphates of lime 62,000. Industry and labour: number of factories (1937) 4,246; employees 207,506. Industrial production index (1929=100) (average 1938) 155.6 (average June 1939) 155.6. Employment index (1929=100) (average 1938) 109.0; applicants for work (average 1938) 3,602; (average June 1939) 2,091.

(W. H. WN.)

Fire Insurance: *see* INSURANCE, FIRE.

Fires and Fire Losses. The National Board of Fire Underwriters is the accepted authority for the statistics in regard to fire loss. For the year 1939 they place the amount of fire loss at \$313,498,840. This estimate is based on notices of incurred losses received by member companies with an allowance for unreported and uninsured losses. The 1939 losses show an increase of almost 4% over those of 1938 and about 10% over those of 1937. The losses during the month of January and the last four months of 1939 showed a drop from the corresponding months of 1938; all the other months showed gains, the largest being in June when the losses ran 24% over the losses in June 1938. One unusual feature of 1939 was the fact that the December losses were only slightly above those of November, whereas there is usually a large increase. The 1939 December losses were 14.5% below those in December of 1938.

During the year there were 3,080 fires, reported in the daily record of the *Journal of Commerce*, which involved losses of more than \$10,000 each. The total loss during 1939 resulting from these fires was \$130,096,970. It should be stated, however, that these figures include Canadian fires, whereas the figures given in the paragraph above do not.

For many years the fire loss has run comparatively low and it was predicted that that record would be offset by an upward trend. The last two years have shown that there is such a trend although so far it has been very moderate.

It is interesting to note that the middle west reports that the farm fire losses may be placed at \$112,000,000 for 1939. That is a substantial sum to be produced by only one type of risk and it is an increase of about 15% over 1938. No satisfactory explanation of this has been forthcoming and it is the more difficult to explain since there has been an unusual effort during the last few years to reach the rural sections of the United States with fire prevention education. (*See also* INSURANCE, FIRE.) (E. R. H.)

Fisher, Carl G. (1874–1939), American business executive and real-estate promoter, was born January 12 at Greensburg, Ind. In his youth he was a bicycle and auto-

mobile racer. Starting his business career, he organized the Prest-o-Lite company in 1904 and built this organization into a large corporation. He also helped establish the Indianapolis speedway and was reputedly the first to suggest, in 1912, construction of the coast-to-coast motor road which is now the Lincoln highway. While on a vacation at Miami in 1913 he visited the site of Miami Beach, which was then only a deserted swamp. Fisher developed it into a thriving resort city. He also planned and developed Montauk Point at the eastern tip of Long Island. He died at Miami Beach on July 15.

Fisheries. The fisheries of the world, according to the latest tabulations compiled by the U.S. Bureau of Fisheries, annually yield about 17,600,000 tons of 2,000lb. each, of food or products used in the arts and industries, with a value of about \$762,000,000. Of this amount, the fisheries conducted in the North Atlantic area by bordering countries produce about 7,500,000 tons, valued at \$376,000,000; with the production by Eastern North Atlantic countries amounting to 6,100,000 tons, valued at \$312,000,000 and by Western North Atlantic countries to 1,400,000 tons, valued at \$64,000,000. The species of importance taken in the North Atlantic area are herring, cod, haddock, mackerel, halibut, swordfish, crabs, shrimp and oysters. During 1939 a fishery for tuna, of various kinds, was continued in a commercial way off the North Atlantic coast of the United States. During recent years the abundance of several of the former species has declined, due to over-fishing or other causes. Recognizing that this is a serious threat to the livelihood of thousands of fishermen and shoresmen, steps have been taken by the Governments of various countries to conserve several of these important species.

On the Eastern North Atlantic the situation is particularly serious, since fishing vessels must now travel great distances from the home port to obtain a catch. These longer voyages entail increased costs, not only in the operation (fuel, upkeep, etc.) of the vessels, but also for icing or refrigerating the fresh fish brought to port. In an effort to improve conditions, various conservation and economic measures have been suggested. As regards conservation measures a convention was signed in 1937 on behalf of the Governments of Belgium, Denmark, Germany, Great Britain, Iceland, the Irish Free State, the Netherlands, Norway, Poland, and Sweden. This convention, among other things, regulates the size of the meshes of otter trawls and seine nets fished from vessels of the signatory countries in certain waters of the Eastern Atlantic. It was hoped that through regulations under this convention, the fish population on the grounds of the Eastern North Atlantic, especially in the North sea, would be replenished. However, because of the need for maintaining food supplies essential to the people of the British Isles, during the present war, vessels operating from ports in England and Scotland are being allowed to land and sell immature and small fish, a practice originally made illegal under an order in 1938.

As regards economic measures, various plans have been suggested or tried with several of the Eastern Atlantic countries. These are intended to promote the more orderly marketing of fish. Some have been aimed at lowering tariff walls and trade barriers; others, prior to the European war, at reducing the landings of fish to prevent market gluts; and still others at improving quality to promote consumption. In general, though, since the outbreak of the European war, fishing activities have been greatly hampered, causing a reduction in fish supplies. Many countries have requisitioned fishing craft for naval purposes.

On the Western North Atlantic fishing vessels, operating from New England, have had to fish farther and farther from the home port, because of depleted stocks nearer port. This has led to the construction of larger and more modern vessels of the otter

trawl type. In general these vessels are capable of making faster trips to the fishing grounds as some have speeds of 12 knots or more. These vessels also have improved facilities for refrigerating the fresh fish brought to port. In an effort to replete the haddock fisheries of the Western North Atlantic, especially on Georges Bank where depletion of this species has been more evident, operators of trawl vessels have adopted mesh of larger size in the cod end of the otter trawls, in order to allow juvenile fish to escape. Many of the trawlers fishing for haddock and cod are now using the mesh of larger size. The North American Council on Fishery Investigations hopes that this will be made a permanent arrangement by some form of international agreement between the countries prosecuting the haddock fishery of the Western North Atlantic.

As regards the economic fishery situation in the United States in 1939, efforts again were directed toward stabilizing the frozen fish trade. Early in the year there was an accumulation of surplus stocks in cold storage. This caused apprehension among members of the fishery industry. As in 1937 and 1938, the situation was brought to the attention of the U.S. Congress which late in summer enacted measures authorizing the Federal purchase of surplus frozen fish for distribution to relief clients. However, by this time the situation had been relieved by the effects of the European war in stimulating the fishery industry in the United States. Therefore the Federal Government did not effect a widespread program for the purchase of surplus fish as in previous years. On the Pacific coast the new tuna and pilchard fishery off Washington and Oregon was firmly established.

In Newfoundland, the plight of the fishers was given continued study in 1939 and measures were promulgated to improve their welfare. This consisted mainly of Government provision for outfitting the fishermen, in taking steps to improve methods for the curing and marketing of fish, and in developing export markets. Some inducements also were made by Newfoundland to attract fishery concerns from the United States to conduct operations on the Treaty coast. This culminated in the establishment of a fish filleting plant by New England enterprise and development of the herring fishery which supplies fish to a United States factory ship engaged off Newfoundland in the manufacture of fish meal and oil.

In the Maritime Provinces of Canada further progress was made during 1939 in the formation and operation of co-operative associations of fishermen. In addition a salt fish board was established by the Government in Nova Scotia to find new markets for salt cod and to financially assist fishermen whose salt cod is sold in the export markets.

Whaling.—For the past two decades, various nations of the world, notably Norway and Great Britain have been prosecuting the whale fisheries with renewed vigour. Operations have centred almost entirely in the Antarctic, where previous to this time little whale fishing was done, because of dangerous weather and ice conditions. With improved methods for capturing whales, however, and for their manufacture into oil aboard the large and staunchly built factory ships now used, these conditions have constituted no obstacle. The take in recent years has been enormous; for instance, during the period from the season of 1919-20 to the 1937-38 season, inclusive, 383,352 whales were captured in the Antarctic, from which 29,921,126bbl. of oil have been produced, according to Reports XII and XIII (1939) of the Committee for Whaling Statistics, Oslo. One barrel of about 50gal. equals $\frac{1}{2}$ ton. One ton equals 1,016kg. or 2,240 pounds. From the same reports we find that during the 1937-38 season alone 46,039 whales were captured in the Antarctic fishery, from which 3,340,330bbl. of oil were produced. Norwegian whaling accounted for 14,960 whales, with an oil production of 1,157,993bbl.; British whaling accounted for 16,111 whales with an oil production of 1,153,365bbl.; and

the whaling of other countries (especially Japan, Germany, Panama, United States, and others) in this area accounted for 14,968 whales with an oil production of 1,028,972 barrels. During the season 11,227 men took part in the Antarctic whale fishery, of whom 7,826 were Norwegians, 1,840 Japanese, 675 British, and 886 German. Preliminary figures indicate that during the season 1938-39 there were 38,321 whales taken in the Antarctic which produced 2,812,546bbl. of oil.

Apprehension as to the future of the whale fishery, in the face of such intensive prosecution, led to concluding an international convention between 26 powers for the regulation of whaling. This became effective in 1935. While the regulations under this convention have afforded whales much-needed protection, experience gained in recent years has indicated that additional restrictive regulatory measures are needed from time to time. To accomplish this an international agreement for the further regulation of whaling was signed in London on June 8, 1937, on behalf of the Argentine Republic, Commonwealth of Australia, Germany, the Irish Free State, New Zealand, Norway, the Union of South Africa, the United Kingdom of Great Britain and Northern Ireland, and the United States of America. This is now in force. This agreement was further amended to restrict whaling as regards prohibiting the killing of humpback whales in the Antarctic, at a meeting in London in 1938. In 1939 another conference was called in London which recommended the extension of this prohibition for another year. (*See also OCEANOGRAPHY.*) (R. H. F.)

Fitzgerald, Frank Dwight (1885-1939), twice governor of Michigan, an office he held at the time of his death, was born at Grand Ledge, Mich., on January 27 and received his education at Ferris institute in Big Rapids, Michigan. He was committee clerk of the Michigan senate in 1913, proofreader in the house of representatives in 1915, and bill clerk in 1917. From 1923 to 1931 he was business manager of the Michigan State Highway department, and from 1931 to 1934 secretary of State. He was the only Republican in a Michigan State office to survive the Democratic landslide of 1932. He was governor of Michigan from 1935 to 1936 but was defeated for re-election by Frank Murphy. Fitzgerald in turn defeated Murphy for the governorship in the election of Nov. 8, 1938. Inaugurated on New Year's day, 1939, he set out to redeem his campaign pledge of outlawing sit-down strikes in Michigan. His labour bill was passed by the State Assembly on March 16, the day he died at his home in Grand Ledge.

Five-Year Plan: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Flax: *see* HEMP; LINEN AND FLAX.

Floods and Flood Control. *Federal.*—The general Flood Control Act of June 22, 1936, established for the first time in the history of the Federal Government a definite policy for Federal participation in the construction of flood control projects throughout the nation in co-operation with the States, political subdivisions thereof, and other responsible local agencies.

Under the provisions of this Act, local interests were required to furnish lands, easements and rights-of-way for all flood control structures, hold and save the United States free from damages during construction, and maintain and operate the works after completion. The Flood Control Act approved June 28, 1938, provided that all lands, easements, and rights-of-way for reservoirs or channel improvement, or channel rectification projects, shall be acquired in fee by the United States and be a part of the Federal cost of the project.

Construction on 114 Congressionally authorized flood control projects has been completed or is now under way. Also, surveys and the preparation of plans and specifications are in progress for dams and flood protection projects at numerous localities throughout the United States.

In New England, construction has been initiated on reservoirs in the Merrimac and Connecticut river basins and substantial progress has been made on the construction of levees and flood walls at principal cities along the Connecticut river in Massachusetts and Connecticut.

In the Ohio river basin above Pittsburgh construction of Tionesta creek dam has advanced to 75% of completion, Crooked creek dam to 85%, and construction has been initiated on Mahoning and Loyalhanna dams. Channel enlargement on the Conemaugh river at Johnstown, Pa., is about 25% complete. Construction of local protection projects along the Ohio river has been completed at Section 1, Wellsville, Ohio, and is in progress at Ironton, Ohio; Huntington, Ceredo and Kenova, W. Va.; Tell City and Evansville, Ind.; Paducah and Middlesboro, Ky.; and Harrisburg, Illinois. Also, marked progress is being made on the construction of levees in the Wabash river basin.

In the Southwest, construction of Conchas dam on South Canadian river in New Mexico is virtually complete. Construction of the Fort Supply and Great Salt Plains dams in the Arkansas river valley in Oklahoma is well under way.

On the Pacific Coast the projects for flood protection at Los Angeles-San Gabriel river basins and the Santa Ana river basin, involving construction of reservoirs, debris control basins, dikes, and channel improvements are well advanced. Construction was started on Mud Mountain dam in Puyallup river basin, Wash., and improvements along the Columbia river and its tributaries in Washington and Oregon are progressing rapidly. Projects at eleven localities in this basin were completed in 1939.

(J. L. S.)

The United States in the year 1939 experienced the worst and most widespread drought in recorded history. A few floods occurred in certain areas, however, due to sudden, violent rainstorms. In September the muddy flood waters of the Alabama river spread over thousands of acres of fertile farm land and over 4,500 people were rendered homeless. The Alabama river alone caused crop damage estimated at many millions of dollars. Overnight the river reached the 53.9ft. level. The danger stage is the 47ft. level.

In southern California and Arizona, violent rainstorms called cloudbursts washed out highways and railroad tracks and thus interrupted traffic for over a week. A six-inch rain was suddenly deposited on the usually dry desert, causing sudden violent streams in usually dry gulches with disastrous results to highways and railroads.

During Sept. 1939, authorities estimated that 25,000,000 people faced starvation and suffering in China due to floods in the Hopeh province and the Yellow river basin. Fall crops were completely destroyed. The floods extended around the city of Tientsin for a radius of 50mi., while beyond this area the swollen rivers and creeks covered most of the central and southern province of Hopeh. Refugees were sleeping on strawstacks and farm animals were starving amid scenes of utter desolation.

In Dec. 1939 the district southeast of Manila in the Philippines was stricken with disastrous floods. Heavy loss of life occurred in the provinces of Isabella and Cagayan due to the flooding by the swollen waters of the Cagayan river.

Hundreds were homeless, much livestock was lost and there was heavy destruction of rice and tobacco crops in a wide area flooded by torrential rains which accompanied a typhoon.

Floods of this type occur on various portions of the earth's surface wherever similar geographical and climatic conditions prevail, such as on the Mississippi, the Hwang Ho, or Yellow river, the Ganges and the Nile. Such floods are caused by climatic conditions over which man has little or no control. They are largely seasonal and have occurred and are apt to occur at any time on the lowlands of such large rivers whenever the rainy season commences.

For example, heavy tropical rains occur on the headwaters of the Nile river in April and May, causing rise in the river often as much as three feet per day. The resulting flood stage invariably reaches a maximum at Assuan early in September.

Since the alluvial valley of the Mississippi has been formed by the flood waters carrying the silt from the higher elevations, floods must have always occurred on the Mississippi. Recorded floods of varying intensity have frequently occurred on the Mississippi during the past 150 years, but with no definite regularity. From 1785 to 1930, 30 major floods have been recorded.

Floods also occur due to unusual circumstances such as the breaking of dams constructed for impounding water, or to so-called cloudbursts. The Johnstown flood in Pennsylvania in 1889 was of this type. The Johnstown flood was preceded by torrential rains which caused the breaking of the dam above Johnstown on the Conemaugh river, resulting in loss of life and great destruction to property.

In the United States, during the year 1939, definite continued progress was made in measures for flood control. The 76th Congress appropriated \$133,000,000 for flood control. The National Resources Committee published comprehensive reports on their basin wide studies of flood control and allied multiple purposes projects of water control. The United States has been divided into 17 districts into which the various drainage basins of the country are grouped for convenience of study and planning. Much work was actually started, many plans were formulated and much information was obtained regarding the problem of these districts. In many of these districts in the northeastern part of the United States, the problem of flood control is intimately connected with that of pollution abatement, power development, sanitation and recreational opportunities. In all, the problem of soil erosion is important.

In the Tennessee valley a proposed system of dams upon the upper reaches of the river will provide complete regulation of the Tennessee river for navigation, flood control, and the development of electric power.

The upper Mississippi is characterized by a multiplicity of interlocking problems. Navigation, flood control, water-power, drainage, pollution abatement, surface and underground water supplies, recreation, wild life conservation, soil erosion, and siltation in streams, channels and reservoirs all are involved and most of them must be solved before flood control can be accomplished in this area.

There are many complex and conflicting interests involved in the utilization and flood control of the waters of the Colorado river. One unit in this control on the Colorado river, the Boulder canyon dam has been completed. The partial utilization of the waters from Boulder lake by the cities of southern California has been accomplished by the successful completion and opening of the Los Angeles viaduct. Other problems of the use of the waters of the tributaries of the Colorado in other States remain yet to be solved.

In the California area, problems of flood control are largely local problems, although problems of the abatement of pollution, navigation, and recreation problems are important. During 1939, definite progress was made to control the flood waters of the Sacramento river by the commencement of the construction of the Shasta dam for multiple purposes of flood control, power development, and irrigation.

Flood control is a major need of the Puget Sound area. It is proposed to control the flood waters of the Columbia river water system by the construction of ten major dams on the river water shed. Two of these, the Grand Coulee and Bonneville dams, are on the upper-most and lower-most reaches of the river.

The establishment of reservoirs on the headwaters of the various streams which make the main river are of immeasurable value in flood control and while the cost is very large, definite progress is being made in this direction.

Reforestation and improved soil management are vital problems not only as methods of flood control, and their wide adoption would have a pronounced influence on the prevailing state of the agricultural and lumbering industries. The correct solution of the problems presented by floods can only be obtained by a full and scientific understanding of all the contributing causes of flood disasters. Definite progress also has been made in solving the problems due to soil erosion. The introduction and practice of strip cropping, more sod and pastures, and terracing have reduced not only soil erosion but have reduced the damage due to floods in some areas. (See also SOIL EROSION and SOIL CONSERVATION; DAMS; FORESTS; METEOROLOGY.) (R. O. St.)

Great Britain.—In Oct. 1939 the exceptionally heavy flooding of 600 sq.mi. in the Midland area, caused by torrential rains and the overflowing of the Grand Union canal, was followed by the overflow of several rivers. Bridges were swept away, many houses flooded and great damage done to property. Among the flooded rivers were the Nene, Welland, and the Great Ouse, which flow through the Fenlands to the Wash. These floods, with unusually high tides in the Wash, would probably produce a flooding of the Fens, such as occurred in 1937-38, when there was a sea surge of about 4ft. above the highest known tide. In the Fenlands there is great activity in the work done to deal with these high floods which, although they occur at long intervals, cause serious damage to property and the valuable cultivated land, some of this land being many feet below the level of the river. For each of the Rivers Nene, Great Ouse, Welland and Witham there is a Catchment Board which is granted financial assistance by the Government for approved schemes.

The main method of flood control is the use of extensive Washlands consisting of reservoirs for the storage of water on the rivers. These Wash storages are controlled by sluices operating so as to collect water from the rivers during high tides and to discharge it into the Wash at low tides. In the Great Ouse, the principal river, which drains an area of 3,200 sq.mi., there are two systems of Wash drainage, one operating on the lower marshes and the other on the higher tributaries of the river.

Included in the work for the Nene are the improvement of the shipping facilities at Wisbech and the provision for sea-going vessels at Peterborough; in that of the Welland and the Witham, the cutting through of the outfall of the Welland to join the Witham at its point of discharge into Boston Deep.

Bulgaria.—Proposals have been made for the extension of the irrigation system in the valley of the River Mantza, where the soil for the most part is permeable loam. The annual rainfall being not more than 20in., there is an insufficient supply of water for the crops, consisting of cotton, tobacco, flax, and fruits, which constitute a greater part of the exports. The present irrigation system, controlling an area of 67,000ac., is inefficient and in-

adequate and should be extended to 370,000 or 500,000 acres. The river and its affluents provide the necessary water but, as their flows are subject to great variation, there is a pressing need for the construction of dams for the storage of water in the hills.

Greece.—Considerable progress is being made in the scheme for the protection of 3,700,000 stremmas (about 900,000ac.) of land in the provinces of Thessaly, Epirus and Boeotia in Greece and at Platania in Crete, the work which commenced in 1934.

Rivers are being widened and deepened, canals dug, protective embankments constructed to deal with floods. Thousands of square miles of land, now either under water or liable to floods, will be reclaimed for cultivation. In the Thessalian plains, for example, where a total area of about 430,000ac. have been subject to flooding, an additional 20,000ac. of protected land has been put under cereal crops for the 1939 harvest.

On the completion of the scheme, in about seven years' time, several towns and villages will be protected from flooding and an area of 150,000ac. added to arable land of a small hilly country, in addition to 750,000ac. being protected from flooding during the five winter months of rains.

Turkey.—On December 27 the first of a series of earthquakes devastated Anatolia, particularly in the east and north. A few days later, after torrential rainfall, there were heavy floods in western Anatolia, in the regions of Izmid, Brusa, and Smyrna.

A number of rivers overflowed their banks, sweeping away villages, inundating towns, and causing a considerable loss of life and property. Some districts were converted into vast lakes; in others, the rivers completely changed their courses. Troops, including sappers and miners, were sent to help in the rescue work and to attempt to dam the flood waters. The extent of permanent work in flood control required in this connection is, however, awaiting investigation.

Iraq.—An important irrigation project was completed by the construction of the Kut barrage across the River Tigris, near the town of Kut, in Iraq. The barrage has 56 openings, 19ft. 6in. wide, each controlled by a single sluice gate. The average flow of the Tigris at low water is 12,400 cusecs and at high water, where there is a rise in level of about 20ft., the flow is 140,000 cusecs.

A stream, the Shatt-el-Gharraf, which joined the Tigris immediately downstream of the barrage, is now diverted by the construction of a canal so that its mouth, where there is a regulator, is upstream of the barrage, the old mouth being closed by a dyke. The stream has long been used as a source of irrigation water for cultivation purposes, but during the dry season and in times of very low water it dries up.

Australia.—In Queensland, where the rain falls in intermittent heavy showers, there are frequent droughts which cause great losses to stock raisers; the average losses of sheep alone represents £1,500,000 per annum. A scheme dealing with the north-eastern area of the state has been suggested for the storage and the distribution of the flood waters at an estimated cost of no less than £30,000,000. Connected with this scheme is the development of hydro-electric power for lighting and industry and for pumping and irrigation.

Australia's Great Artesian basin has a total area of about 600,000 sq.mi., more than half of which is in Queensland. The flow from this basin is known to diminish at the rate of 2.5% per annum, although the water capacity is large, and it is possible that after the lapse of a few years the pumping of the water will have to take the place of artesian action.

In New South Wales the Burrinjuck dam for the storage of storm water, which was completed in 1913 and had a capacity of 772,000 ac.ft. of water, is being reconditioned at an estimated cost of £A 1,850,000; its capacity will be increased up to 815,000 acre feet. (See also IRRIGATION; METEOROLOG.) (J. Ev.)

Florida, extreme south-eastern State of the United States, is called the "Peninsula State" because of its peculiar outline. Its coast line is greater than that of any other State, extending 472mi. along the Atlantic and 674mi. along the Gulf of Mexico. Its total area is 58,666 sq.mi., of which 3,805 sq.mi. are water surface. Florida contains about 30,000 lakes, many of them connected by subterranean channels. Population (U.S. census, 1930) 1,468,211; (State census, 1935) 1,606,842; (Federal estimate, July 1, 1937) 1,670,000. Of the 1935 population 1,139,063 were white and 463,205 coloured; 989,743 were urban and 613,972 rural. Only about 45,000 were foreign born. The largest cities were Jacksonville, Miami and Tampa, with populations of 146,289, 127,600 and 100,151 respectively. Tallahassee, the capital, had 11,725.

History.—The present State elective administrative officers, whose terms expire in Jan. 1941, are Fred P. Cone, governor; R. A. Gray, secretary of State; George Couper Gibbs, who succeeded the late Cary D. Landis who died in his term of office on May 10, 1938, attorney-general; J. M. Lee, comptroller; W. V. Knott, State treasurer; Colin English, superintendent of public instruction; and Nathan Mayo, commissioner of agriculture.

Education.—At the head of the State school system is the superintendent of public instruction. The school revenue is de-

rived from a permanent school fund, special State and county taxes, the one-mill *ad valorem* tax and legislative appropriation on the teacher-pupil-unit basis, which yielded \$11,607,387, inclusive of \$309,083 for free text-books for the fiscal year, July 1, 1937–June 30, 1938. More than 3,300 students are enrolled at the University of Florida and about 1,800 in the Florida State College for Women. Municipally operated institutions of learning are: the University of Miami, the University of Tampa and St. Petersburg college. Rollins college and Southern college are privately endowed institutions. The last report of the State Superintendent of Public Instruction shows a total enrolment in the public schools of 396,824, of which 292,959 were in schools for whites, and 103,865 were in coloured schools. State appropriations for higher education for the year 1938–39 amounted to \$2,299,760.

Banking and Finance.—The last available figures on the State's financial condition, taken from the report of the State treasurer for the fiscal year ending June 30, 1939, show a total balance in the treasury of \$8,811,444.82. The total bank deposits in Florida national and State banks, on basis of last available figures (June 30, 1939), were \$311,247,000.

Agriculture, Manufactures and Minerals.—Agriculture is the most important industry in the State. In 1935, the year of the last State census, there were 72,857 farms with a total acreage of 6,048,406, of which 1,142,767 were in crops, 489,006 were idle (fallow), 2,362,674 were in pasture, 1,140,941 were in farm woodland and the rest mainly in fruit.

The more important crops for the 1939–40 season were:

	Acres	Production	Value
Oranges (including Tangerines) . . . . .	..	35,900,000 boxes	\$35,900,000
Grapefruit . . . . .	..	17,000,000 boxes	21,375,000
Tomatoes	38,400	4,948,000 bu.	12,230,000
Snap beans	64,000	7,135,000 bu.	7,041,000
Celery	7,300	2,184,000 crates	5,374,000
Corn (Maize)	805,000	6,038,000 bu.	4,347,000
Tobacco	32,500	23,410,000 lbs.	2,809,000
Irish potatoes	26,700	3,235,000 bu.	3,644,000

On Jan. 1, 1939, the livestock resources of the State were: 694,000 cattle, 111,000 milch cows, 566,000 swine, 37,000 sheep, 19,000 horses, and 41,000 mules. The more important manufactures of the State were lumber, naval stores (turpentine and rosin) and cigars.

In the 12 months season April 1938 to March 1939, Florida produced 7,440,000gal. of gum turpentine valued at \$1,660,000 and 505,000bbl. (500lb. each) of rosin valued at \$4,450,000. Her 1938 lumber output was 700,000,000 bd.ft., mainly cypress and yellow pine, representing a value of nearly \$21,000,000.

The cigars manufactured yearly in Florida represent approximately \$20,000,000. Two comparatively recent industries are the growing of tung nuts and the production from them of tung oil, and the making of paper from pine pulp.

The State has only limited resources in minerals, but has large and valuable deposits of phosphates, lime and limestone, and less extensive, though highly valuable, deposits of kaolin and fuller's earth. The value of the phosphates produced in 1938, the last full year for which figures are available, was around \$13,000,000.

(J. M. L.)

Flour and Flour Milling. **Wheat Flour.**—The trend toward flours of a more creamy colour has progressed conservatively throughout the principal milling centres of the United States until at present there seems to be a general consumer acceptance of the longer extraction grades. While the swing toward richer breads reached and passed its peak during the summer of 1939, there seems to be little inclination on the part of either the millers or bakers to revert to the highly bleached short patent flours of a decade past.

The critical European situation has had virtually no effect upon the quality or quantity of wheat flour available to American consumers. Plentiful wheat reserves should tend to preserve this condition, and during 1940, at least, there seems small probability that the quality of American milled flours may be adversely affected either by increased exports or by changes in the United States' neutrality position.

Vitamized flours may soon appear upon the market if recent patents describing the addition of vitamin "C" derivatives to flour are credited with economic feasibility by the milling industry. British patent No. 503,476, issued June 30, 1939, describes the addition of ascorbic acid, sodium ascorbate or isoascorbate to flour in the form of a powdered mixture with an inert inorganic material, such as tri-calcium phosphate etc., or, with an inert organic substance such as starch. While the addition of vitamin containing supplements to bread formulas is not new, the present widespread interest in vitamins is likely to result in a more favourable consideration of flour vitamization by millers than has been shown in the past.

Flour Milling.—A recent compilation of data on milling capacities by the statistical department of the *Northwestern Miller & American Baker* (Vol. 16, No. 11, 1939) shows that Minneapolis

Flour Production Data for Buffalo, Kansas City and Minneapolis, 1936-1939
(*Northwestern Miller & American Baker*, Nov. 1, 1939, p. 48.)

Year	Number of Mills	Capacity Bbl. daily	Production Bbl. Annual
Buffalo 1936	7	49,000	10,425,335
1937	7	49,500	10,251,801
1938	7	49,500	10,200,421
1939	8	49,500	7,882,245*
Kansas 1936	9	31,800	6,202,743
City 1937	9	31,800	7,332,452
1938	9	31,800	7,479,540
1939	8	31,800	5,441,893*
Minne- 1936	16	46,600	6,452,667
apolis 1937	16	43,150	5,681,400
1938	16	43,150	5,736,662
1939	15	30,150	4,214,267*

*Nine months only.

has yielded second place as an American milling centre to Kansas City, first place having been taken by Buffalo, N.Y., in 1930. Since reaching a production peak of 18,541,650bbl. in 1916, and a top capacity of 95,350bbl. per day in 1923, Minneapolis has steadily declined as a milling centre. Kansas City has maintained about the same daily capacity since 1926 with a fairly constant level of production of about 7,000,000bbl. per year throughout this period. In the meantime, milling operations at Buffalo have enjoyed a continuous advance, rising in daily capacity from 10,800bbl. in 1909 to the present maximum of 49,500bbl. in 1937.

Canadian flour production during the crop year ending July 30, 1938, was smaller in terms of percentage of capacity operation than at any time since 1932-33, having reached a low of 46.6% as compared with 51.1% for 1936-37, and 53.2% for 1935-36. The present trend is again upward, owing principally to increased exports to the United Kingdom which normally takes about one-third of the Canadian output.

In milling technology and research, emphasis is now on wheat conditioning and related subjects; humidity control, and air-conditioning. Recent investigations have established definite humidity levels required at the various stages of the milling process to maintain desirable moisture contents of the mill streams (C. O. Swanson, 1938-39).

High temperature tempering of wheat has been investigated by Hugo Kuhl, who in *Chem. Zeitung* (German), vol. 63, p. 469, 1939, presents data on new and original research in connection with high temperature-short time wheat treatment.

In the field of new products from wheat, the isolation and structural identification of new sterols from the non-saponifiable

portion of wheat germ oil represents one of the most important discoveries of 1939. (S. Bernstein, and E. S. Wallis, *Journal of the American Chemical Society*, July, 1939, p. 1903. Also see E. S. Wallis and E. Fernholz, *Ibid.*, 1939.) (See also VITAMINS.)

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Fluorspar. The chief producers of fluorspar are the United States (35%), Germany (28%), the Soviet Union (14%), and the United Kingdom (8%); France was formerly an important producer, but has declined, while the Soviet Union has increased its output. The world total is now approaching 500,000 metric tons.

The United States imports enough to bring the domestic consumption up to about one-half of the world supply. The iron and steel industry in 1938 took 70% of the domestic consumption, glass and enamel, 13%, and hydrofluoric acid and its derivatives 16%; other uses are small. Of the imported spar, 52% was used for steel and 48% for hydrofluoric acid. (G. A. Ro.)

Fokker, Anthony Herman Gerard (1890-1939), Dutch aeroplane designer and manufacturer, was born April 6 at Kediri, Java, and died December 23 at New York city.

See *Encyclopædia Britannica*, volume 9, page 441, for further details concerning his career.

Folk Dancing: see DANCE.

Food and Drug Laws: see ADVERTISING; *Legislation*; *CANNING INDUSTRY*; *DRUGS AND DRUG TRAFFIC*; *SOAP, PERFUMERY AND COSMETICS*.

Food Prices: see AGRICULTURE.

Football. During the past few years football has staged a steady recovery, and directors of athletic set-ups, with their large overhead and interest and amortization obligations on stadia, are breathing more easily. This uptrend continued in 1939, particularly in the South, which led in attendance gains and in the number of strong teams. Notre Dame attracted close to 500,000 people to its nine games. The record crowd of the year, 103,000, saw Southern California play the University of California of Los Angeles (U.C.L.A.). Army and Navy met before 102,000 in Philadelphia, with a heavy fog blanketing the field.

The foremost teams of the season, as ranked in a nation-wide poll of sports writers, were Texas A. & M., Tennessee, Southern California, Cornell and Tulane. All five were unbeaten, though Tulane was tied once and Southern California, twice. Tennessee, like Duke in 1938, went through its schedule without being scored upon and extended its winning streak to 23 games since 1937. The last 15 of them were all won by shut-out scores.

Southern California was again named to represent the Pacific coast in the Rose Bowl at Pasadena and invited Tennessee as its opponent. Led by Ambrose Schindler, the Trojans penetrated the Volunteers' defence twice to win, 14-0, and end the Southerners' long stretch of unblemished supremacy. Southern California had too much power for Tennessee, whose attack was weakened by the poor condition of George Cafego's knee.

Texas A. & M. and Tulane met in the Sugar Bowl at New Orleans. The tremendously powerful running of John Kimbrough from his full-back position enabled the Aggies to gain a 14-13 decision.

Cornell, which had its biggest season since 1923, scored one of 1939's notable victories in defeating Ohio State at Columbus. The triumph was hailed as the most signal blow struck for Eastern

football in a long time. The Ithacans declined all offers for post-season games.

In the other Bowl contests, Georgia Tech, with one of the trickiest attacks of the season, defeated Missouri, 21-7, in the Orange Bowl at Miami; Clemson and the renowned Banks McFadden overcame Boston college in the Cotton Bowl at Dallas, 6-3, and Catholic university played to a scoreless draw with Tempe (Ariz.) State Teachers in the Sun Bowl at El Paso. The West defeated the East in the All-Star game at San Francisco, 28 to 11, and the South won from the North in the Blue-Gray game at Montgomery, Ala., 33-20.

Sectional honours went as follows: Cornell was rated the No. 1 team of the East, followed by Boston college, unbeaten Duquesne, Fordham, Princeton, the champion of the Big Three; Villanova, unbeaten Georgetown, Penn State and Holy Cross. Pittsburgh, coached no longer by Dr. Jock Sutherland, and Carnegie Tech, Eastern leader in 1938, were not up to standard.

The Big Ten championship was won by Ohio State, although it lost to Michigan, whose defeat by Illinois was the most stunning reversal of the year. Iowa failed by a point to tie for the title. The Hawkeyes were the surprise of the year under their new coach, Dr. Eddie Anderson, who brought them up from the bottom of the conference to lose only one game and to defeat Notre Dame and Minnesota among others. Dr. Anderson was voted the "coach of the year" and Nile Kinnick of Iowa was awarded the Heisman Trophy as the "player of the year," his leading rivals being Tom Harmon of Michigan, Paul Christman of Missouri and George Cafego of Tennessee. At the close of a most disastrous year, Chicago withdrew from Big Ten competition. Missouri won the Big Six title, and other strong teams in the Middle West were Notre Dame, Michigan, Nebraska, Oklahoma, Minnesota, Purdue and Northwestern. Southern California carried off the Pacific Coast championship, barely holding off U.C.L.A. in the final game to gain a scoreless tie. U.C.L.A. was unbeaten, but tied four times; Santa Clara and Oregon State were the other outstanding teams on the Pacific coast.

Texas A. & M. was the champion of the South-west, in which the quality of the other teams was not up to the usual high standard. Southern Methodist, Baylor and Texas were next best after the Aggies. The race for the South-eastern honours ended in a triple tie among Tennessee, Tulane and Georgia Tech, while Duke and Clemson shared the Southern Conference title. Other strong teams in the South were North Carolina, Alabama, Auburn, Kentucky and Louisiana State.

Tulane was almost entirely a power team and used the pass sparingly. Tennessee was more of a running team than a passing team, and the same was true of Southern California, to a less extent. Texas A. & M. gave much less emphasis to the pass than the successful teams of the South-west have given in recent years. Cornell was one of the most brilliant passing teams of 1939, as well as one of the most efficient in its defence against the pass.

Professional football enjoyed its best season in the 18 years' history of the National Football League. The largest professional crowd since 1925 saw the New York Giants defeat the Washington Redskins in New York to win the Eastern Division championship. In the play-off with the Green Bay Packers, champions of the Western Division, the Giants were overwhelmingly defeated at Milwaukee and relieved of the national title.

Canada.—The Winnipeg Blue Bombers, led brilliantly by the shifty-running Fritz Hanson and boasting an unusually strong line, defeated the Ottawa Rough-Riders in the Grey Cup final for the title, 8-7. The blocking and tackling of the Bombers was acclaimed as the best seen in the East. Ottawa qualified as the representative of the East by first defeating the Toronto Argonauts for the Big Four title and then conquering the Sarnia Imperials, On-

tario Rugby Football Union champions. The Bombers defeated the Calgary Bronks for the Western Interprovincial title to qualify as the representative of the West. Western Ontario won the intercollegiate championship. (A. Da.)

Great Britain.—There was nothing outstanding in the 1938-39 Rugby season unless it was that after a brilliant record the previous year, Scotland occupied the bottom position in the international championship table. They were beaten by all the other countries, who each won a couple of matches, thus being bracketed as the top. The best matches in the series were undoubtedly those between England and Ireland at Twickenham, and between England and Scotland at Murrayfield. The first was a sheer joy to watch, Rugby football at its cleanest and best. At Murrayfield, England won back the Calcutta Cup from Scotland, but only because the Lancashire captain, J. Heaton, kicked 3 superb penalty goals, which was all England could score against 2 tries. There were no really promising players, suggesting high class, though R. S. L. Carr (England), M. J. Davies (Wales) and D. O'Loughlin (Ireland) were very good. Of the older players, F. J. Morgan (Ireland), T. F. Huskisson (England) and S. Williams (Wales) played splendidly again.

Warwickshire won the County championship for the first time in their history, whilst St. Mary's won the Hospitals Cup for the sixth year in succession, with probably the best club side in London. A cheery dinner in London celebrated the jubilee of the famous Barbarians Club, and amongst those who responded for the club was A. Allport, one of the Old Originals.

The Royal Navy won the inter-services tournament, though had the Royal Air Force begun as well as they finished, under the brilliant leadership of G. A. Walker, the championship would have been theirs, and easily.

One of the greatest players of all time, Gwyn Nicholls, the Welsh centre three-quarter, died towards the end of the season.

Rugby League.—Halifax met Salford at Wembley in the Challenge Cup final, before a record crowd, and a better match can hardly be imagined. Salford were badly, though unexpectedly, beaten by 20 points to 3. But when the Rugby League final was played the following week at Manchester, Salford had some compensation, for they beat Castleford (who had previously beaten Halifax by 21 points to 4) by 8 points to 6. Allan Edwards played superbly as the left wing for Salford. Salford, for all their magnificent history, had never won the Rugby League final before.

It was a great disappointment to followers of both Codes that the war came, for the Australians were due in England (and actually arrived) to play under the Rugby Union Laws, and the New Zealanders to play under the Rugby League Laws.

Association Football.—No club was more in the public eye than Wolverhampton Wanderers, and there was a time when they looked more than likely to win both the F.A. Cup and the League championship. In the end they lost both, being the runners-up in each case. Portsmouth beat them at Wembley in the Cup final, and beat them well by 4 goals to 1. But only the most ardent of the Portsmouth supporters ever dreamed of such a result. For once, youth did not have it all its own way, though nerves had a good deal to do with the defeat as well. Perhaps this "youth" idea was carried too far in 1939, for many of our leading clubs were playing youngsters well under 20 years of age, and in the end had to pay for it.

Everton were four points ahead of the "Wolves" in the championship table. The clubs to be relegated were Birmingham and Leicester City, and two famous old clubs, Blackburn Rovers and Sheffield United, came up from the Second Division to take their places. The Rangers won the Scottish League championship once more, and Belfast Celtic did the same to the Irish League. Ireland finished at the bottom of the championship table, the

other three countries registering a couple of wins each. For the always attractive match between England and Scotland, at Hampden Park, Glasgow, there was an amazing crowd of 150,000. England won it by 2 goals to 1, Lawton (Everton) and Beasley (Huddersfield) scoring for England, and Dougal (Preston North End) for Scotland. In the amateur world, England won the championship very easily, Moor Green the A.F.A. Cup and Bishop Auckland the F.A. Amateur Cup. The Earl of Athlone has accepted the office of president of the Football Association. (D. R. G.)

Ford, Ford Madox (1873-1939), British author, was born Ford Madox Hueffer in Merton, England, the son of a German who was music critic of *The Times* of London. He was related by marriage to William Rossetti, a founder of the pre-Raphaelite brotherhood. He professed to despise the group's art, and his early work was influenced instead by frequent travels in Germany and by a profound admiration for French culture. He began to write at an early age and had his first book, *The Brown Owl*, published in 1890. His first volume of poetry, *Poems for Pictures*, appeared seven years later. In the meantime he had published a biography of Madox Brown, his grandfather, and had written several novels. Though Ford unquestionably enriched contemporary English letters, literature may owe its greatest debt to him as the man who helped Joseph Conrad master English, and as the critic who first recognized the abilities of D. H. Lawrence, H. M. Tomlinson, James Joyce, T. S. Eliot, and others. He collaborated with Conrad in *The Inheritors* (1901) and *Romance* (1903). As editor of *The London Review*, which he founded in 1900, he made a practice of publishing the work of unknown authors. His *Transatlantic Review*, published in Paris after the World War, was the first journal to direct public attention to the stories of Ernest Hemingway, who was one of the group known as "Ford's boys."

Ford published more than 60 books in all, the most celebrated of which are *Some Do Not* (1924), *No More Parades* (1925) and *A Man Could Stand Up* (1926)—a series about England and the World War. In 1938 he finished his monumental *March of Literature*. He died at Deauville, France, on June 26.

Foreign Exchange: see EXCHANGE RATES.

Foreign Investments in the United States.

Total foreign long-term investments in the United States rose by \$420,000,000 during 1938, that is, from \$5,270,000,000 at the end of 1937 to \$5,690,000,000 at the end of 1938. Holdings of United States common stocks increased by \$400,000,000 of the \$420,000,000, largely as a result of the higher level of market prices that prevailed at the end of 1938. Another factor in the increase was an inflow of \$64,000,000 of foreign funds for investments in American securities. As a consequence, common stocks comprised 39.5% of the total foreign long-term investments in the United States as of the close of 1938 compared with 35.1% a year earlier.

Net purchases of United States securities by foreigners have been an important part of the large inflow of foreign funds since

TWO GIRLS' FOOTBALL TEAMS clashed in Oct. 1939 before 3,000 spectators in Los Angeles

early in 1934. Those net purchases have at various times been stimulated primarily by the chances of sharing in the benefits of advancing prosperity in the United States and at other times by the desire to escape the periodic political crises and threats of war which have plagued Europe. The effect of this inflow of foreign funds is evident in the estimates of the investments and, more particularly, in the higher percentage of outstanding shares that are held by foreigners—2.72% in 1934 and 4.41% in 1938.

Foreign Investments in the United States by Types of Investments,
1934, 1936 and 1938
(Year-end data: in millions of dollars)

Types of Investments	1934	1936	1938
Long-Term Investments:			
Direct investments (book value) . . .	1,518	1,640	1,685
Common stocks (market value) . . .	1,202	2,700	2,250
Preferred stocks (par value) . . .	351	455	425
Bonds (par value) . . .	536	563	580
Other investments (various values) . .	750	750	750
Total . . .	4,357	6,108	5,690
Short-Term Investments:			
Total . . .	614	1,620	2,193
Grand total . . .	4,971	7,728	7,883

Source: Long-term data from Finance Division, Department of Commerce, Economic Series, No. 5, *The Balance of International Payments of the United States in 1938*. Short-term data from *Bulletin of the Treasury Department*, as adjusted in *The Balance of International Payments of the United States in 1938*.

As of the end of 1934, Canada, the United Kingdom and France accounted for 58% of the total foreign long-term investments in the United States. By the end of 1938, the share of these countries had declined to 56%, although in value their investments had risen to \$3,200,000,000. German investments were insignificant by comparison. Netherlands and Switzerland, on the other hand, increased their holdings from 24% to 27% of the total, or from \$1,061,000,000 to \$1,550,000,000.

During the first nine months of 1939, sales of United States securities by foreigners exceeded purchases by \$46,000,000. The principal sales were for the account of the United Kingdom. Some sales may have been induced by the anticipation of lower stock prices at the outbreak of the war. Contrary to what happened in 1914, however, the stock market experienced a substantial rise after the opening of the war in September, part of which was later lost.

Foreign short-term investments in the United States amounted, at the end of 1938, to \$2,193,000,000 compared with \$1,920,000,000 (revised) at the end of 1937. A large proportion of these foreign funds—88%—were in the most liquid form, that is, deposits in American banks. Furthermore, less than 5% of the foreign short-term investments were payable in foreign currencies. The

United Kingdom had the largest volume of funds in the United States. After a 67% increase during the 12 months of 1938, British short-term investments amounted to \$446,000,000. Canada was second with \$239,000,000, followed by Switzerland, \$224,000,000; France, \$196,000,000; and Netherlands, \$102,000,000. German dollar assets of this character were very small, amounting after several years of withdrawals to \$20,000,000. During the first nine months of 1939, foreign banking and brokerage funds in the United States increased greatly as a result of an almost continuous inflow from January through September, which aggregated \$1,159,000,000. Approximately one-half of this inflow was for the account of the United Kingdom, France and Canada, and just over one-third for neutral European countries.

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Foreign Missions. Four developments during 1939 affected the course of Protestant missions from the United States. First was the continuation of the hostilities between China and Japan. This proved both a handicap and an aid. It was a handicap, because the tightening Japanese cordon on the coast made access to the interior more difficult, Japanese bombings injured some mission property and added to the load carried by mission hospitals, and Japanese occupation brought various annoyances to missionaries. It was of assistance, because the relief given to the suffering and the general disorganization of society made the Chinese more receptive to the Christian message. In Japan and Korea (Chosen) the churches increasingly felt the pressure of the Government, intent as it was upon promoting national solidarity in the face of the war. A second development was the outbreak of the European war. By embarrassing German missions, especially in British colonial possessions and in India, and by jeopardizing the incomes of British societies, it placed heavier burdens upon American societies. The burden of the Protestant foreign missionary enterprise was forced more than before upon the churches of the United States. A third development was the effect of the meeting of the International Missionary Council held at Tambaram (Madras) in Dec. 1938. On their return, delegates to the conference, including international teams, spoke widely of the findings of the gathering. The effect was to hearten missionary forces, to give an added sense of the world-wide extent of Christianity, and to bring important modifications in missionary policy. The fourth development was financial. The incomes of the mission boards remained about the same as the preceding year and in some instances registered a slight increase.

Roman Catholic missions from the United States felt the impact of both the Far Eastern and the European war. Since Roman Catholic missions from the United States are so largely concentrated in the Far East, notably in China, Manchoukuo, and Korea, they were especially affected by the Sino-Japanese conflict. Reinforcements continued to be sent, extensive relief was given, and large numbers of baptisms were reported. (K. S. L.)

Forests. When armies march as dictators command, America must strengthen internal as well as external defenses. Besides building warships the U.S. must stop heedless abuse of land, water, and forests, for they are sources of raw materials and other necessities of life, and of employment and income. Besides constructing aeroplanes, these resources must be built up and kept continuously and fully productive.

With muskets beside them, early pioneers chopped down white pine and tulip trees four feet and more in diameter, rolled most

of the logs into piles, and burned them. By crop-planting time the clearings afforded a measure of protection from Indians. Then a young and eager nation expanded westward, and these processes were repeated. Now there are no hostile Indians. Forests no longer occupy good agricultural land to any extent. The need for wholesale forest clearing for settlement and cultivation no longer exists. But merchantable standing timber has been reduced by one thousand billion board feet since 1910. Forests were abused in this process, as in earlier ones. And they are still being abused.

Woods practices responsible for ghost towns are not practised on the national forests, which are administered by the Forest Service of the U.S. Department of Agriculture. In 1939, 1,290,581,000ft. of timber were harvested from them under regulations that promise succeeding crops; forage was used, under permits, by more than 6,500,000 domestic stock; sources of water for towns, cities, industries, and agriculture were protected; more than 32,750,000 visits were made by people who enjoyed wildlife and recreational opportunities and facilities.

There are nearly 176,000,000ac. of public land in the national forests. They are valuable, but the best three-fourths of all forest land that bears commercially valuable timber is privately owned. It furnishes more than 95% of the timber cut, and is subject to most of the forest drain. It also renders public services that are worth more to 130,000,000 of people than are the values it has to the fewer people who own it. Privately owned forests are therefore a major factor in the nation's forest situation. So are problems facing private owners.

There are many such problems. A basic one is that, in most regions as in the country as a whole, mill capacities are so far above the power of accessible land to produce usable forests that the time many operations may continue at present levels is limited. Another is the need to operate at a profit. It costs money to grow enough timber in time to keep operations going. This has never been done by most private owners. Instead, most profits have come from liquidation. Other problems include forest taxation, tax delinquency, and insurance, credits at low interest, and freight rates.

One important problem is to protect forests from fire, insects, and diseases. Another is to extend markets. This emphasizes the paradoxical situation of the tremendous need for new building and repairs for example, on the one hand, while forest industry plants are operating at only about half their mechanical capacities.

Approximately 202,000,000ac. of commercial forest land are in industrial and nonfarm ownership. Farmers, who own 139,000,000ac., have the same problems most industrial owners do, but there is a group of problems that because of certain conditions become of particular importance to farm forest owners. One is that forest ownership is more widely distributed among farmers, and that individual ownership is generally in smaller tracts. Pressure to cut farm forests for cash to buy food and clothing is greater, and this sacrifices values and throws unripe timber on the market more often. Most farmers grade, price and manufacture forest products less effectively than larger industrial forest owners; and it is also more difficult for the small owner to locate and keep profitable markets.

Despite progress in solving many of these problems, neither public nor private forest policy, nor private nor public action programs, are adequate to meet present or future conditions.

Briefly, basic requirements for an adequate Federal forest policy are:

First: That although the forest policy may be stated in terms of land use and of trees and industries, its fundamental purpose must be to assure social and economic security for dependent people and communities.

Second: That since it helps control floods, prevent erosion, and protect

cultivated lands and crops, all forest land must be adequately protected.

Third: That operations on commercial forest land, irrespective of ownership, shall be so conducted that (a) the land will promptly be put into new production of commercially usable timber, and (b) it will be kept in this condition.

Fourth: That output of forest industries shall be so related to present supplies of accessible and usable timber, and to the power of forest lands to produce it, that continuous use of that timber by dependent industries and communities and people shall be possible.

This is the policy that guides the Federal Forest Service in its administration of the national forests and in redeeming those responsibilities that, entrusted to it by Congress, have to do with forest lands in private ownership. It is a policy that aims to prevent disastrous busts, even though it may level out short-lived booms; that aims at social and economic security for labour and industry, alike.

An adequate forest action program should include (1) public co-operation with private owners of forest land, (2) public regulation of cutting practices on privately owned forest land, and (3) extension of public ownership and management of forest land.

This action program embodies principles all of which have already been recognized, at least in part, by Federal or State legislation or both. To some extent each essential part of the program has also been recognized by many private owners and forest industries, and has been and is being translated by some of them into action in the woods. Agreement is general on the need for more public co-operation with industrial as well as farm owners of forest lands. But most forest industries prefer self-regulation, as railroads and public utilities once did. A measure of regulation by industry of its own cutting practices on forest lands has been practiced for some time in the Pacific Northwest, for example; a region that has most of the remaining virgin timber, and one-third of all U.S. saw timber. Yet many mills in the vicinity of Grays Harbor, Puget Sound, and the Lower Columbia basin are already facing curtailment. Many dependent families and communities there are threatened. In the Northwest as a whole indications already point to a gap of a generation or more between the end of the usable old growth and the time when enough usable second growth will be ready for cutting.

Despite self-regulation in the Pacific Northwest, 70% of its privately owned commercial forest land is not yet under adequate forest management. Nearly 55% of it probably will not restock without costly artificial planting. And although State and Federal aid have been given, and progress has been made in fire protection, the majority of woods operations on private forest lands in the Pacific Northwest—and in most other major forest regions—are still on a liquidation basis. This nullifies much of the public co-operation and aid that have been extended to private owners over the years.

Public co-operation and aid are essential to private owners of forest land, but experiences in the Pacific Northwest—and elsewhere—seem to indicate that public regulation, and reasonable extension of public ownership and management, afford the only effective assurance that forest industries will respond effectively to such aid. (E. H. CL.)

British Empire.—One of the outstanding events in British Empire forestry during 1939 was the disaster caused by bush fire in Australia, especially in the State of Victoria, in January. Many lives were lost and damage valued at several million pounds resulted. A Royal Commission was appointed to inquire into the causes of these fires and make recommendations for future safeguards.

Reforestation continues to make steady progress especially in Great Britain and South Africa. In New Zealand the rate of reforestation is being reduced and more attention is being paid to management of the native forests. In Canada the importance of sustained yield forestry is being more and more appreciated and

there, as in the United Kingdom, the necessity for some greater regulation of the management of private forests is becoming more apparent. During the year the Forestry Commission of Great Britain held further conferences on the subject of private forestry. The outbreak of the war and the necessity for increasing home grown supplies further emphasized the necessity for some form of state control over this class of forest. In India and Burma the new governments under the India and Burma Acts, while fully realizing the value and importance of their forests, find that the call for funds for "nation building" departments necessitates a reduction of staff and expenditure on forests, a policy that may have serious effects on the value and future revenue of the forests. Progress is being made by colonial forest departments especially in the important aspect of land planning and soil conservation which is being tackled in co-operation with the agricultural and veterinary departments. Soil conservation and the protection of water supplies is becoming one of the most important branches of protective forestry.

Until the start of the European war, timber markets were recovering from the setback of 1938 and the Empire imports of timber, especially from British Columbia, to the British Isles were on the increase. Since the start of the war there has been a still further increase of activity in British Columbia in order to fill the gap in timber imports caused by the loss of the Baltic trade. (See also LUMBER.) (H. R. BD.)

Formosa (TAIWAN), a large island in the Western Pacific, between the East and South China seas, bisected by the Tropic of Cancer; area 13,429 sq.mi.; capital, Taihoku; population (1936) 5,451,863, mainly Chinese. Formosa has been part of the Japanese Empire since 1895, when it was conquered from China. Part of the island was under Dutch rule from 1624 until 1662; and remains of forts and other Dutch buildings are still to be found in the southern part of the island, in the vicinity of Tainan. Formosa is governed by a governor-general, assisted by an advisory Council, the majority of the members of which are Japanese. The present governor-general is Admiral Seizo Kobayashi. An important Japanese naval base, access to which is closely restricted, is at Mako, in the Pescadores, islands off the western coast of Formosa. The importance of the island as an aeroplane and naval base has been demonstrated during the hostilities with China. Formosa is, in proportion to its size, perhaps the richest of Japan's colonies. It has been intensively exploited, Japanese investment in the island being estimated at 400,000,000 yen (\$200,000,000 at pre-devaluation rates of exchange). Most of this capital has been invested in the sugar industry. Exports from Formosa in 1936 amounted to 387,948,978 yen and imports to 292,685,948 yen. Gold has been discovered in the island, production in 1936 reaching a value of 4,223,712 yen. As the agricultural possibilities of the island have been largely developed there has been a tendency to establish industries, among which the chemical and spinning are the most prominent, and also to utilize the island's considerable resources in hydro-electric power. (W. H. CH.)

Forster, Albert (1902—), German politician, was born August 27, in Fuerth, Bavaria. His training was for commerce, but after two years of apprenticeship in a bank he was dismissed for membership in the Nazi party. He was then a local Nazi group leader at Fuerth for five years. Moving to Danzig, he became *Gauleiter* (district leader) of that city in Oct. 1930. In that year also he was elected to the Reichstag. In April 1933 he was appointed leader of the Organization of German Employees in Danzig, and four months later a Prussian State councillor. He also edited the newspaper *Deutscher Vor-*

posten. Forster came into international prominence in 1939 during the disputes over the Free City. On August 10, after a visit with Hitler, he declared the imminence of Danzig's return to the Reich. On August 24 he was elected head of the government of Danzig to replace Arthur Greiser. On September 1, the day Germany invaded Poland, he proclaimed in a letter to Hitler the formal reunion of Danzig with Germany. Then, like Seyss-Inquart after the Austrian *anschluss*, and Henlein after the pact of Munich, Forster sank into relative oblivion for the rest of 1939, except to introduce Hitler when the latter made a speech at Danzig September 19.

Fort Peck Dam: *see* DAMS.

Foundations: *see* DONATIONS AND BEQUESTS and Foundations under their specific names.

France, area, 212,736 sq.mi.; population (est. June 1938) 41,980,000. Chief towns (pop. 1936): Paris, 2,829,746; Marseilles, 914,000; Lyons, 571,000; Bordeaux, 258,000; Nice, 242,000; Toulouse, 213,000; Lille, 201,000; Nantes, 195,000. President, Albert Lebrun. Language, French; religion, Roman Catholic; c. 1,000,000 Protestant. (X.)

History.—Confronted since Nov. 1938 by Italy's noisy though unofficial demands for Tunisia, Jibuti, and other French possessions, Daladier replied with a triumphal tour through Corsica and North Africa (January 2-6) and a stout proclamation to the chamber on January 26 that France would maintain the integrity of her empire and the security of the imperial routes. No time was lost in re-enforcing the defences in North Africa and in seeking still closer relations with Great Britain, made public by Foreign Minister Bonnet's announcement of January 26 that, in the event of war, all forces of Great Britain would be placed at the disposal of France and reciprocally those of France at the disposal of Britain. The two powers again acted in concert in recognizing General Franco's Government on February 27. Socialist and Communist deputies greeted with bitter opposition this new "appeasement to dictator nations"; but Daladier maintained that he wished to relieve France of the necessity of defending a third frontier 450mi. long. These differences in no way impeded the rearming which went on apace throughout the spring. On January 31 the chamber voted to prolong the two-year military service law. The economic and fiscal policies initiated by Reynaud in November had rapidly borne fruit: interest rates had declined, a result of growing confidence among businessmen; savings banks deposits had risen sharply; and unemployment was on the wane. Optimism was being generated anew through this industrial revival, when Hitler's proclamation of a protectorate over Bohemia and Moravia (March 15) and his extension of "protection" to Slovakia (March 16) shocked France and galvanized the country into redoubled activity. On March 18, Robert Coulondre, ambassador to Germany, was recalled for consultation, and, with Great Britain, the French Government issued a formal protest against Hitler's conquest, marking the end of "appeasement." Of greater import was Daladier's action of March 17, when he summoned parliament to grant him *plein pouvoir*—full power—to rule France by decree in all matters affecting national defence until November 30. In the acrimonious chamber debate ensuing, Daladier admitted that the decree might involve a temporary suspension of individual liberties, but adamantly refused to change its provisions. On March 18 the chamber passed the bill 321 to 264; next day it became law by a senate vote of 286 to 17.

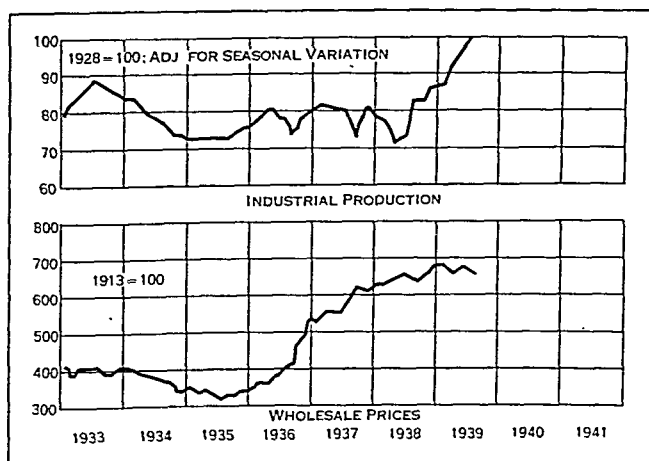
Daladier quickly put to use the extensive powers thus granted him, and on March 20 he promulgated 16 decrees. The first four dealt with military defence, empowering the Government to extend

the service periods of those already with the army and to call specialists to the colours without a preliminary voting of credits by parliament, permitting the formation of new regiments, prohibiting the unofficial publication of military information, and reorganizing the Sixth military region, of which Metz is the centre. Nine decrees were intended to speed production in armaments and all supplies necessary for national defence: in such industries the maximum work week was increased to 60 hours; overtime, for which rates of pay were scaled down, could be exacted by the employer; Government control was established over all local employment agencies, and specialists could be required, under heavy penalty, to take jobs in distant factories. Three further measures proposed by Reynaud included appointment of a comptroller for Marseilles to carry out "municipal reform" in that city, elimination of several autonomous Government bureaus, and suspension of employment of new State functionaries for 1940.

On the closing day of the month, announcement was made of the decision of the British and French Governments to aid Poland in resisting any threat to her liberties. To offset German trade advances in the Balkans, commercial treaties were concluded on the same day with Poland, Rumania, and Yugoslavia, opening French markets to products of these countries.

A factor in the unification of France was the "draft Lebrun" movement which got under way shortly before the presidential election. With Lebrun at the helm, an internal political battle would be averted, and Daladier might pursue unmolested the course upon which he had embarked. Favoured candidates patriotically withdrew in the president's favour, and he was re-elected on April 5, polling 506 votes to 398 for all his opponents.

As the Italians precipitated a new crisis by overrunning Albania (April 7), Great Britain and France hastily guaranteed Greece and Rumania aid against any attack which they themselves undertook to resist (April 13). And a new batch of laws issued April 21 placed France definitely on a war footing. State control of the labour force was extended: the 45-hr. week was widely adopted, with remuneration for overtime at a rate only 5% higher than the normal pay. New fiscal measures were introduced to pay for armaments, whose manufacture had by now almost entirely supplanted public works; municipal finances and administration were reformed with a view to economy; limits were placed on the price-guaranty for grain; superfluous civil servants, when not transferred to other Government departments or to private concerns, were to be retired; a progressive tax was placed on the profits of munitions firms; strict scrutiny of incomes was established for taxation purposes; and, lastly, a sales tax of 1% was levied.



FRANCE: Production and wholesale prices (*The Annalist*)

Replying to Hitler's blistering speech of April 28 on his differences with Poland, Daladier expressed to the chamber on May 11 the determination of France to defend herself against aggression through military measures, and to act jointly with Britain in safeguarding the independence of Central and Eastern Europe. This statement drew unanimous support from the chamber, although the next day there was a division over its practical interpretation, the Socialists voting against Daladier because of Reynaud's methods, which, they maintained, thrust upon the poor the chief burden of preparedness, and were prejudicial to labour's interests.

Reynaud, nothing daunted by these criticisms, continued to renovate the fiscal and economic structure of the nation. On May 15 the Treasury floated a bond issue of 6,000,000,000fr. at 98, maturing in 40 years, and paying 5% interest, which was fully subscribed within 24 hours. France's industrial comeback since the fall of 1938 had been truly impressive. Since October, 27,000,000,000fr. in gold had been repatriated, and the reserves of the Bank of France had risen to 14,700,000,000 francs. The business index, which had been 82 in 1938 (100=1928), had climbed to 92 in March 1939, and 97 in May.

On June 6, the control of the entire war machine was entrusted to General Maurice Gustave Gâmelin, named by decree commander-in-chief of France's defence forces (land, sea and air). To bolster French defences in the Near East and hinder a potential German *Drang nach Sud-osten*, a joint Franco-Turkish declaration of mutual assistance was signed June 23; a separate treaty returned to Turkey the Hatay Republic in the Levant, long under dispute between the two countries (the joint declaration was amplified by the tripartite treaty of October 21). On July 1 France notified Germany that no unilateral change in Danzig's status would be tolerated, but angry mutterings across the Rhine augured ill for any satisfactory settlement of the issue. In response to Soviet proposals for a united peace front against Fascism, conversations were carried on in Moscow, supplemented by consultations among the military staffs of Great Britain, France and Russia. A deadlock, however, was early reached which apparently concerned, among other things, the entrance of Russian troops into Poland, Russia arguing that only by sending troops could she meet the enemy on a common front, and Poland adopting a "timeo Danaos" attitude.

The tension created by Hitler's fist-shaking and the apparent failure of the Moscow talks was heightened by events at home. On June 16, the submarine "Phenix" sank off the coast of Indo-China, giving rise to rumours of sabotage which increased the general irritability of spirits. On June 27, when parliament was closed by a brief presidential decree approved in the chamber by a vote of 350 to 231, the premier made a grim and enigmatic reference to espionage in France, giving currency to frightened rumours of a Fascist Fifth Column. The story was later unfolded: French agents had apparently been guilty of collusion with Otto Abetz, head of German propaganda in France, who had recently been invited to leave the country. On July 29, the cabinet approved decrees aiming to counteract the declining birth rate: 9,000,000,000fr. were provided in bonuses and credits to large families, severe penalties for abortion were instituted, adoption was simplified, and childless married couples and bachelors were taxed. A rigorous spy code, approved at this time and issued August 1, provided the death penalty for 10 crimes and offences against the security of the State, including unauthorized publication of military information or information on counter-espionage; persons accused of such crimes were to come before military courts.

On July 29 also the cabinet assented to Daladier's momentous decision to suspend the national elections scheduled for 1940, prolonging the life of parliament for two years. Socialist and

other parties of the Left declared the move unconstitutional; but their attempts to whip up indignation in the country failed, for France's attention was riveted on the international scene.

Throughout August, conversations in Moscow were pursued, while Hitler pressed Poland steadily harder. France and England were determined that this time they would not be caught napping. Nevertheless the news of a Russo-German commercial treaty (August 19) came as a bitter surprise. Thenceforward catastrophic events followed one another in headlong succession. On August 21, France, in reply to the impending Soviet-German non-aggression treaty, mobilized reservists and reaffirmed her pledge to Poland. On August 24, the cabinet met to consider Hitler's refusal of the British suggestion for a truce; ominous warnings were issued to evacuate Paris. On the same day the terms of the 10-year German-Soviet pact were disclosed, causing havoc among French Communists. Many hastily repudiated the party; others justified the pact with the argument that Stalin had subtly thrown a wrench into the Axis machinery, and published a proclamation of their loyalty to France. This declaration of goodwill did not save them; the publication of *Humanité* and *Ce Soir* was suspended by a decree of August 26, and Communist headquarters in Paris and provincial cities were raided.

August 26 the French and British military missions left Moscow, and on Sunday night, August 27, the French Government published an account of the correspondence of the previous day. Daladier had sent the German Fuehrer a note, suggesting the direct negotiation between Warsaw and Berlin and asking him not to "spill the blood of two great peoples who long only for peace and work." Hitler, trying to separate France from her ally, had responded that Danzig and the Polish Corridor must be returned to the Reich, but that he had no quarrel with France and wanted only to keep the peace with her. Uninfluenced by these soft phrases, the French Government on August 28 closed the frontier with Germany, established a co-ordinated censorship of all means of communication, under Jean Giraudoux, and took steps to evacuate the population from military zones. On August 30, thousands of children were removed from Paris, and the railroads were turned over to the army.

At dawn of September 1, the German attack on Poland began. France and Great Britain demanded, in a joint note presented to the German Government by the French and British ambassadors, the cessation of aggressive action by Germany and the withdrawal of her troops before any negotiations could be undertaken; failure to comply would be met by fulfilment of allied obligations to Poland. General mobilization was decreed for September 2, and parliament, convoked for 3 P.M. that day, adopted a war budget bill of 69,000,000,000fr., indicating support of the premier in any steps he chose to take. The time limit for the expiration of the last warning to Germany was fixed for 5 P.M., Sunday, September 3. When it was clear that no response from Hitler was forthcoming, France was automatically at war (*see EUROPEAN WAR*), but inclement weather and the strength of the opposing fortifications produced a stalemate in the west for the remainder of the year. Although Paris and other large cities had taken air-raid precautions, as the fall wore on "black-outs" were lightened. Moreover, it was planned, beginning October 17, to demobilize older classes and reservists, releasing them for service in factories and on farms.

New decrees altered the economic life of the nation. On October 8 a provision of the National Wheat Office limiting wheat planting was suspended. A decree aimed at conserving France's food resources forbade the slaughter and sale of all meats on Monday and beef on Tuesday (October 17). By a decree of October 30, French workers were placed at the command of the Government in factories whose services were required for national de-

fence; such workers may be requisitioned and assigned to plants where they are most needed.

Economic co-ordination was facilitated by the appointment of D. Serruys as high commissioner of national economy on September 15, and by the creation, on November 10, of a new department in the Ministry of Marine, the Direction of Maritime Transport, in charge of the cargoes and crews of requisitioned vessels. Production of aeroplanes was speeded, and the lifting of the embargo in the United States (November 4) gave France an opportunity to purchase large numbers of planes. Of great moment was the economic accord reached by France and Great Britain at a meeting of the Supreme War Council on November 17. This agreement provided for co-ordinated purchase and distribution of munitions, war materials, oil, and food, and common control of shipping and economic warfare. The resources of both countries in raw materials, means of production, and tonnage were to be used in the common interest; competition in foreign purchases to be avoided; and limitations suffered by either country to be equally distributed. By the end of November a co-ordinating committee was established, with Jean Monnet, an Englishman of French antecedents, as chairman. Hitler's hope of driving a wedge between the two allies seemed less than ever capable of realization.

France used the respite afforded by a period of military inactivity to strengthen her diplomatic position. On October 6, Daladier, who had assumed the Ministry of Foreign Affairs on September 13 (Bonnet going to the Ministry of Justice), replied to Hitler's peace proposals in a speech to the senate foreign affairs committee: "We must go on with the war that has been imposed upon us until victory, which will alone permit the establishment in Europe of a regime of real justice and lasting peace." On October 19, after tergiversation on the part of Turkey, caught between two fires, that power was induced, by the promise of extensive credits, to sign a treaty of mutual assistance with France and England against aggression in the Mediterranean or the Balkans; Turkey would not, however, be expected to take action which would bring her into conflict with Russia.

On November 12, President Lebrun and King George VI stated the war aims of their peoples with a vagueness characterizing such statements to date: the King said the British would not lay down

arms until the bogey of recurrent German aggression had been banished; Lebrun spoke of the reparation of injustices imposed on Austria, Czecho-Slovakia, and Poland.

Internally, the French cabinet has been occupied with the quashing of dissentient opinion, in particular with anti-war propaganda. The Government's attention was concentrated mainly upon the Communists. The Party as such had been dissolved on September 26, but many of its members had formed a new group known as the Workers and Peasants Party, under whose auspices a letter was presented to Herriot, president of the chamber, on October 3, urging consideration of Hitler's peace offers. Tracked down by the military police, who charged that the new party was an illegal reconstitution of Communist groups, many Communist deputies were summoned before military tribunals and jailed. Likewise, members of the outlawed sect were systematically weeded out of municipal administrations.

On November 30, parliament convened to extend Daladier's decree powers for the duration of the war. A proposition was adopted that each decree should be submitted for legislative approval within one month, if parliament were in session.

On December 12, Great Britain and France reached a financial accord which was the logical outcome of the economic agreement of November 17. It provided that the currencies of the two nations should be stabilized at the rate of 176½fr. to the pound until six months after the signing of a peace treaty; also, that each country might pay in its own currency for goods purchased from the other, without touching its gold reserve. No foreign loans or credits were to be negotiated without prior agreement, and all loans granted to the allies were to be shared on a 60-40 basis, Great Britain receiving 60%. Finally, close contact was to be maintained on internal price policies. On December 19, the Allied Supreme War Council announced its decision to aid Finland morally and materially insofar as that was possible. As the year closed, the senate unanimously voted an 80,000,000,000fr. budget (December 28) and a credit of 259,000,000,000fr. for military expenses during 1940 (December 29). (D. C. McK.)

Education.—In 1938: Elementary: schools, 81,000; scholars, 4,900,000. Secondary: schools, 546; scholars, 270,000.

Banking and Finance.—In francs, revenue, ordinary (1937), 43,379,000,000; expenditure, ordinary (1937), 48,168,000,000;

DEAUVILLE, like all other French resorts, was barren of its gay crowds in the autumn of 1939, except for a lone American expatriate, Berry Wall



revenue, ordinary (1938), 54,264,000,000; expenditure, ordinary (1938), 63,840,000,000; expenditure, ordinary (est. 1939), 64,500,000,000; expenditure, extraordinary (est. 1939), 29,600,000,000; public debt, domestic (Aug. 31, 1939) 432,634,000,000; exchange rate (average 1938), 170.7fr.=£1 stg.; exchange rate (Dec. 8, 1939), 176.5fr.=£1 sterling. Notes in circulation (Nov. 30, 1939), 146,370,000,000fr.; gold reserve (Nov. 30, 1939), 97,266,000,000 francs.

Trade and Communication.—Overseas trade, merchandise: imports (1938), 45,981,163,000fr.; exports (1938), 30,585,730,000fr.; imports (1939, 8mo.), 32,539,000,000fr.; exports (1939, 8mo.), 23,832,000,000 francs. Communications: roads: national 48,000mi.; secondary 330,000mi.; railways 26,300mi.; airways, 1938: mileage 6,392,000, passengers 99,855, mails carried 1,894,000lb.; freight carried 2,956,000lb.; shipping, gross tonnage (June 30, 1938) 2,903,600; shipping, net tonnage entered (monthly average 1938) 4,330,000; shipping, net tonnage entered (July 1939) 4,467,000; shipping, net tonnage cleared (monthly average 1938) 3,561,000; shipping, net tonnage cleared (July 1939) 2,769,000. Wireless receiving set licences (Dec. 31, 1937) 4,163,692; telephones (Jan. 1, 1938): 1,540,300 subscribers; motor vehicles licensed (Dec. 31, 1937): total vehicles 2,200,000, of which 558,000 are commercial vehicles.

Agriculture, Manufactures, and Mineral Production.—In 1938: in quintals, wheat, 101,479,000; barley, 12,908,000; rye, 8,111,000; oats, 54,574,000; maize, 5,786,000. Mineral production for 1938 (monthly average, metric tons): coal, 3,875,000; pig iron, 504,000; steel, 515,000. Wine (1937), 54,310,000 hectolitres. Industry (1929=100): index of industrial production (average 1938), 76; index of industrial production (June 1939), 92. Labour: index of employment (average 1938: 1929=100) 81; (June 1939: 1929=100), 82; unemployed in receipt of benefit (average 1938) 376,000; (average Sept. 1939) 317,000.

(See also CHINESE-JAPANESE WAR: *Japan and Foreign Powers*; CZECHO-SLOVAKIA; DEMOCRACY; EUROPEAN WAR; FINANCIAL REVIEW.)

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Franco, Francisco (1892–), Spanish soldier and head of the Spanish Government, was born in Galicia. After military service in Morocco, he became a colonel in 1926, and served under the Spanish republic of 1931 in the Balearic islands, being later transferred to Morocco again. In 1935, he was made chief of staff. Under the Lerroux-Robles Government he became governor of the Canary islands. On the outbreak of the civil war in June 1936, he flew to Tetuan, in Spanish Morocco, and there organized the transport of Foreign Legionaries and Moorish troops to the Spanish mainland, whither he soon followed. After the death of Gen. Sanjurjo, Gen. Franco became military leader of the insurgents, and on Oct. 1, 1936, was solemnly invested at Burgos with the titles of "Commander-in-Chief of the Spanish Army" and "Chief of the Spanish State."

After the end of the civil war on March 29, 1939, Franco demobilized his army and began the tremendous task of reconstruction. After several postponements and rumours that Italy wished to delay withdrawal of her troops from Spain, he held his "victory parade" in Madrid May 19. Franco first invited the voluntary assistance of all his subjects in rebuilding Spain, then conscripted such assistance on July 30, 1939, when he ordered that every able-bodied Spaniard should work for the state 15 days each year without pay. In August, by decree, he added the title of prime minister of Spain to the others he possessed, and swore

in his new cabinet at Burgos, which remained the capital of the country until Madrid was restored October 16. Franco showed no disposition to become involved in the European war, and on September 4 he issued a declaration of "strictest neutrality." Reputedly he was deeply chagrined over the Nazi-Soviet pact of non-aggression.

Frankfurter, Felix (1882–), American jurist, was born in Vienna on November 15 and emigrated with his family to the United States as a child in 1894. He graduated from the College of the City of New York in 1902 and was granted his degree of bachelor of laws with highest honours from Harvard four years later. After completing his legal education he became assistant to Henry L. Stimson, then United States attorney for the southern district of New York, in which position he enthusiastically joined the "trust-busting" campaign of Theodore Roosevelt and helped prosecute several large corporations. In 1911 he was appointed a law officer in the Bureau of Insular Affairs in Washington and remained there for three years until he was offered a professorship of administrative law at Harvard in 1914. Except for various leaves of absence he remained on Harvard's faculty thereafter. During the World War (1914–18) he was assistant to secretary of War Newton D. Baker, assistant also to the secretary of Labor, counsel for the President's Mediation commission, and chairman of the War Labor Policies board. At the Paris Peace conference in 1919 he represented the interests of the Jewish people. On Jan. 5, 1939 he was appointed associate justice of the Supreme court to succeed the late Benjamin N. Cardozo. Frankfurter is an eminent authority on criminal, administrative, and constitutional law and on the Supreme court; he is the author of many volumes and articles upon these and other legal subjects.

Franklin, Philip Albright Small (1871–1939), U.S. shipping executive, was born at Ashland, Md., on February 1. After an education in public and private schools he worked for a time in Paris, and upon his return to the United States he started his shipping career as an office boy for the Atlantic Transport company in Baltimore. Later he became traffic agent, manager, and general manager; and in 1902 he was made president of the line when it became affiliated with the International Mercantile Marine company. He was made vice-president of the latter organization in 1916 and as its president from 1921 until his retirement in 1938 he directed seven steamship lines before three of these (the White Star, Red Star, and Leyland lines) were sold. In 1918 he was chairman of the Shipping Control Committee, a joint creation of the U.S. War Department and the U.S. Shipping Board, and had control over some 1,200 vessels. For this service he was awarded the Distinguished Service Medal; he was also a chevalier of the Legion of Honour. He died at Locust Valley, L.I. on August 14.

Freemasonry: see MASONIC ORDER.

French Colonial Empire. Total area (approx.) 4,787,000 sq.mi.; total pop. (est. Dec. 31, 1937) 112,177,000. Certain essential statistics of the French colonies, protectorates, and mandates are given in the table on page 304.

History.—The 70,000,000 inhabitants of the French overseas possessions are not governed by a single administration. Algeria comes under the minister of the interior; the protectorates of Tunisia and of Morocco, and the mandated territory of Syria, under the minister for foreign affairs; the rest of the colonies and the mandated territories of Togo and the Cameroons under the min-

ister for the colonies. There are 3 colonial policies which do not necessarily coincide. In 1939 the policy pursued by the minister for the colonies, M. Mandel, appeared to be more active and more liberal than that of his colleagues at the other ministries.

North Africa.—The developments of the first eight months of 1939 were dominated by the prospect of war. Military preparations and economic planning took precedence over political and social reforms. German claims to her former colonies and Italian agitation over Tunisia and Jibuti stirred French public opinion, from indifference to colonial solidarity.

Anti-French propaganda was most active in North Africa, through broadcasts in Arabic from Bari, Berlin, and Seville, and through the agency of those Moroccan nationals, installed in Spanish Morocco, who supported the idea of a Tetuan-Cairo axis, modelled on the Rome-Berlin axis. Its success was slight.

French Colonial Empire

COUNTRY AND AREA sq. miles (approx.)	POPULATION ('000's omitted)	CAPITAL, STATUS, GOVERNORS, PREMIERS, ETC.
FRANCE, 212,736 . . .	41,970	Paris, republic, <i>President</i> : M. Albert Lebrun. <i>Premier</i> : M. Edouard Daladier.
ASIA		
FRENCH INDO-CHINA, 283,000	23,300	Saigon, <i>Governor-General</i> : General Catroux.
ANNAM, 55,800 . . .	5,050*	Hue, protectorate, <i>Resident-Superior</i> : M. Graf- feul.
CAMBODIA, 69,200 . .	3,040*	Pnom Penh, protectorate, <i>Resident-Superior</i> : M. Thibaudeau.
COCHIN-CHINA, 25,400	4,616*	Saigon, colony, <i>Governor</i> : M. Veber.
LAOS, 88,800	1,012*	Vientiane, protectorate, <i>Resident-Superior</i> : M. Touzet.
TONGKING 43,800 . .	8,700*	Hanoi, protectorate, <i>Resident-Superior</i> : M. Châtel.
KWANGCHOW WAN, 310	250	Fort Bayard, territory (leased from China), <i>Administrator</i> : M. Le Prévot.
FRENCH INDIA, 100 . .	300	Pondicherry, colony, <i>Governor</i> : M. Bonvin.
SYRIA AND LEBANON, 77,700	3,600	Damascus, mandated territory, <i>High Commis- sioner</i> : M. Puaux.
AFRICA		
ALGERIA, 845,400 . . .	7,400	Algiers, colony, under jurisdiction of the Min- ister of the Interior, <i>Governor-General</i> : M. Le Beau.
MOROCCO (F.), 165,800	6,430	Rabat, protectorate, under the Minister of Foreign Affairs, <i>Sultan</i> : Sidi Mohammed. <i>Resident-General</i> : General Nogues.
TUNIS, 48,800	2,670	Tunis, protectorate, under the Minister of Foreign Affairs, <i>Beys</i> : Sidi Ahmed. <i>Resident- General</i> : M. Labonne.
FRENCH SOMALILAND, 8,380	50	Jibuti, colony, <i>Governor</i> : M. Deschamps.
MADAGASCAR AND DE- PENDENCIES, 236,900	3,800	Antananarivo, colony, <i>Governor-General</i> : M. Coppet.
REUNION, 920	210	St. Denis, colony, <i>Governor</i> : M. Aubert.
FRENCH EQUATORIAL		
AFRICA, 867,700 . . .	3,500	Brazzaville, <i>Governor-General</i> : M. Boisson.
GABON, 106,500 . . .	410*	Libreville, colony, <i>Lt.-Governor</i> : M. Masson.
MIDDLE CONGO, 159,700	747*	Brazzaville, colony, <i>Administrator</i> : M. Bahot- Launoy.
OUBANGUI-CHARI, 214,600	834*	Bangui, colony, <i>Lt.-Governor</i> : M. de Saint-Mart.
CHAD, 386,900 . . .	1,432*	Fort Lamy, colony, <i>Lt.-Governor</i> : M. Eboué.
FRENCH WEST AFRICA,		
1,807,700	14,750	Dakar, <i>Governor-General</i> : M. Cayla.
SENEGAL, 77,000 . . .	1,795*	St. Louis, colony, <i>Lt.-Governor</i> : M. Parizot.
MAURITANIA, 330,000	383*	St. Louis, colony, <i>Lt.-Governor</i> : M. Beyries.
FRENCH GUINEA, 97,000	2,011*	Conakry, colony, <i>Lt.-Governor</i> : M. Giacobbi.
IVORY COAST, 183,000	3,851*	Abidjan, colony, <i>Lt.-Governor</i> : M. Crocicchia.
DAHOMY, 43,000 . .	1,352*	Porto Novo, colony, <i>Lt.-Governor</i> : M. Annet.
FRENCH SUDAN, 577,000	3,569*	Koulouba, colony, <i>Lt.-Governor</i> : M. Desanti.
NIGER, 500,000 . . .	1,747*	Niamey, colony, <i>Lt.-Governor</i> : M. Rapenne.
CAMEROONS, 161,200 .	2,400	Yaoundé, mandated territory, <i>Commissioner</i> : M. Brunot.
TOGOLAND, 20,000 . .	781	Lomé, mandated territory, <i>Administrator- Superior</i> : M. Montagné.
AMERICA		
FRENCH GUIANA, includ- ing Inini, 34,700 . . .	37	Cayenne, colony, <i>Governor</i> : M. Chot-Plassot.
GUADELOUPE, 600 . .	310	Basse-Terre, colony, <i>Governor</i> : M. Pierre-Allye.
MARTINIQUE, 386 . .	255	Fort-de-France, colony, <i>Governor</i> : M. Léal.
ST. PIERRE AND MIQUE- LON, 93	4	St. Pierre, colony, <i>Administrator</i> : M. de Bournat.
OCEANIA		
NEW CALEDONIA AND DEPENDENCIES, 7,310	55	Noumea, colony, <i>Governor</i> : M. Pélicier.
NEW HEBRIDES, 4,620 .	60	Vila, condominium, <i>Resident-Commissioner</i> : M. Sautot.
PACIFIC ISLANDS, includ- ing Society Is., Tuamotu Is., Tubuai Archipelagos, etc. 1,540	45	Papeete, colony, <i>Governor</i> : M. Chastenet de Géry.

*Population 1936 census.

President Daladier's triumphal progress through Tunisia and Algeria (January 1-8) revealed an unexpectedly intense hostility to foreign intrigues and this hostility increased after the occupation of Albania. In Tunisia the nomination of the new heir-presumptive to the throne, Tahar Bey, was peaceably effected.

There was intense military activity everywhere. The reinforcement of the Mareth Line, in effect another Maginot Line, 30km. from the frontier of Tripoli, as well as the organization of both men and materials in defence of the three regions, were the work of General Nogues, the resident general of France in Morocco, who had been appointed general of the army and commander-in-chief of operations in North Africa. Safe naval bases were assured in Tunisia, by the manning of Bizerta and the widening and dredging of the La Goulette canal; in Algeria by the completion of jetties for the El-Kebir and in Morocco by preparations at Agadir, while aviation was rapidly increasing. Steps were also taken to develop industrial production to supply the country with provisions should transport be interrupted.

Colonial Possessions.—In the colonies themselves the intense driving force of M. Georges Mandel made itself felt. In politics, the minister stated definitely that if France occupied overseas territories, it was in order to "enfranchise and set free," and in application of these principles a series of decrees was passed extending the rights of the native.

The principal task of the colonial minister, who had been admitted in May 1938 to the permanent committee for national defence, was to ensure the mobilization of the economic resources and military strength of the colonial empire. The results exceeded the most optimistic expectations. Whereas, from 1914-18 in 50 months, the colonies supplied 3,500,000 tons of produce and various commodities, in the last four months of 1939 they were able to send, 1,600,000 tons of cereals, the greater part being from Indo-China, 1,100,000 tons of oleaginous substances needed in Central Africa, 800,000 tons of various colonial commodities (meat, cocoa, tea, bananas, sugars, rum) and 800,000 tons of materials essential for industry (wood, 300,000; coal and various minerals, 350,000; rubber, 60,000; textiles, 40,000).

Assembling these forces of men and materials presented no difficulties. Thanks to the opening of special credits and to the subscription of loans, France was able to construct railroads in the Mossi country, the French West African reservoir of manpower; to open a transmauritanian track, four to nine metres wide, practicable for trucks between Senegal and Morocco thereby eliminating the sea route in troop transport, and to improve the ports of Jibuti, Dakar, Pointe Noire, thus completing the junctions Congo-Ocean, and Cam-Ranh, in Cochin-China. Finally, an agreement was signed between Indo-China and Siam to link them up by a railway.

French Congo: see FRENCH COLONIAL EMPIRE.

French Equatorial Africa: see FRENCH COLONIAL EMPIRE.

French Guiana, a French colony in north-eastern South America including the separately administered interior territory of Inini. Language, French; capital, Cayenne (pop. 11,704); governor, René Veber. The area is 34,704 sq.mi., of which Inini comprises approximately 25,000 square miles. Including nearly 4,000 in Inini, the population is officially estimated at 37,000 aside from uncivilized Indians. About 6,000 are foreigners. The colony is administered by a governor and a general council, and has representation in the French parliament. Inini has its own council. The famous French penal colony, Devil's Island, located along the northern border, is administered separately. Plans to eliminate it made no headway during 1939, due to lack of penitentiary facilities elsewhere, and to the war.

French Guiana's imports are chiefly foodstuffs and manufactured goods, of which two-thirds come from France, the balance largely from the United States and from French colonies. Exports are principally gold, tulip-wood and other cabinet woods, rum and bananas. Virtually all are taken by France. In the first 11 months of 1938 imports were 50,900,000 francs, exports 42,800,000 francs. Uncertainty of communications under war conditions seriously hampered the export and import trade of French Guiana late in 1939.

The colony has regular external steamer and air transport service under normal conditions, 12km. of railway, 250km. of highways, and good interior waterways. The monetary unit is the French franc (value: 2.25¢ U.S.). There were 35 Government primary schools, with 2,724 pupils, four private schools with 793, and one secondary school with 130, in 1938. (L. W. BE.)

French Guinea: see FRENCH COLONIAL EMPIRE.

French Indo-China: see FRENCH COLONIAL EMPIRE.

French Literature. The year 1939 was marked by a national awakening in France, and literature powerfully felt its repercussions. It was a period of self-examination, and a mystic trend emerged which swept over all the manifestations of the spirit. Charles Péguy, the peasant-poet of Orléans, became the symbol of the spiritual renaissance. The war brought an apotheosis of this heroic figure who had fought for the reconstruction of France in prose and poetry before 1914 and who had died in the first battle of the Marne.

Surréalisme, which had given its name to the collective nostalgia for the fabulous and the romantic since 1923, was disintegrating. In the spring of 1939 a new movement sprang up which called itself *Vitalisme* and which announced its program for a new and saner order in literature through vigorous manifestations by Marcel Sauvage, Pierre Loiselet and Robert Gaillard. Although most of the advance-guard magazines—always the begetters of new movements—had to stop publication, because the editors were mobilized, they were immediately continued under reduced conditions at the front. The *journaux du front* began to blossom forth as early as November. Notable among these little blue- and khaki-coloured reviews were *Le Vitaliste*, *Franchise Militaire*, *l'Isard de Metz*. Older reviews, like the *Nouvelle Revue Française*, *La Revue des Deux Mondes*, *Revue de Paris*, continued their publications dividing their material between the military situation and literature. Paul Eluard published his *Chanson Complète* which marks his break with the surrealist technique. In this poem he forsakes his preoccupation with the unconscious universe and returns to a synthesis of clarity and classical beauty. Jean Cocteau revealed *l'Incendie*, a powerfully moving poem, which translates the strange atmosphere of Paris before Munich and the reactions of human love before the menace of destiny. A short time before the war, Cocteau issued his *La Fin du Potomak*, a story, half contemporaneous and half *fantaisiste*, which expressed his attitude in the political struggle of Europe. Pierre-Jean Jouve, author of *Sueur de Sang*, wrote his *Ode au Peuple*, and his *Chevaliers d'Apocalypse*, a grandiose series of eschatological poems, in which he transmitted his metaphysical disquiet and his hopes for France. He attempts to wed mysticism with modern psychology. St. Pol-Roux, the aged symbolist bard of Brittany, issued *La Supplique du Christ*, dedicated to Albert Einstein. It is a book of finely chiselled stanzas which passionately defends the Jews against their racist traducers. Paul Claudel, the greatest mystic Catholic poet today, at the age of 70, completed his *Jeanne d'Arc au Bucher*. This deeply religious work was received with enthusiasm when it was produced in Paris, with music by Arthur Honegger.

The most important among the younger French Catholic poets

is Patrice de la Tour du Pin. He continued his vast projected *Summa* with the publication of new excerpts, chiefly *Psaumes*. His *La Vie Récluse en Poésie* presents and explains the esoteric symbolism and nomenclature of his life-work. The young poet (born in 1911) went to war as a lieutenant and was wounded and taken prisoner in the first days of the fighting.

Criticism was characterized by a return to mystic and spiritual thinking. The analogy between the poetic and the mystic experience was emphasized in the essays published by Marcel de Corte, Raissa and Jacques Maritain, and Rolland de Renévill, while other critics, like Georges Bataille and Michel Leiris, sought this new mysticism in a study of purely mythological analogies. Thierry Maulnier alone defended a classical viewpoint in his *Introduction à la Poésie Française*.

The biggest book-success of the year was strangely enough André Gide's *Journal*. Its appearance as a book, after its fragmentary publication in reviews, created a sensation, and it became the book of the year. With great sincerity and passion Gide gives the reader an insight into his complicated mind. It is a deeply speculative confession revealing glimpses of his political, religious, literary and personal world.

Drieu de la Rochelle, who had been silent for some years, appeared with *Gilles*, the novel of a man's spiritual progress from 1917 to 1937. This recital of 20 years in the life of a man between two wars had a clinical interest, and reveals a fine panorama of the so-called post-war period. Léon-Paul Fargue presented his readers with *Le Piéton de Paris*, a richly metaphorical cinéma of his experience of the city Paris during the last 50 years. Fargue, a member of the Académie Mallarmé, stirred the reader with brilliant verbal inventions and a fine capacity for lyric story-telling. Jules Romains continued his *roman-fleuve* with two new books: *Vorge contre Quinette* and *La Douceur de Vivre*. His vast chronology is moving forward towards the euphoria of the post-war. Daniel Rops, in his *l'Épée de Feu*, told a vigorous story of the ideological conflicts that disturb our age. It is a brilliant dialectical effort, the synthesis of which he sees in a modernized Catholicism. Philippe Hériat won the *Prix Goncourt* with *Les Enfants Gâtés*. It is the story of a girl in revolt against her upper bourgeois family. A sentimental escapade in America liberates her, but when she returns, she submits again to the standards of an archaic family life. Jean Malaquais, a Pole writing in French, received the *Prix Renaudot* with his novel *Les Javanais*. It is the story of a colony of refugees working in a southern lead mine, written with a strong naturalistic style. Paul Vialar was the recipient of the *Prix Femina* for his *Rose de la Mer*. It is a series of delicately wrought psychological narratives of adventure. Roger de Laforest was rewarded with the *Prix Interallié* for his *Les Figurants de la Mort*, the story of a Utopian general and his mythical conquest of a country. (E. Js.)

French Pacific Islands: see PACIFIC ISLANDS, FRENCH.

French Somaliland: see FRENCH COLONIAL EMPIRE.

French Sudan: see FRENCH COLONIAL EMPIRE.

French West Africa and the Sahara: see FRENCH COLONIAL EMPIRE.

Freud, Sigmund (1856–1939), Austrian psychologist and founder of psychoanalysis, was born of Jewish extraction on May 6 at Freiberg in Moravia, then a part of Austria-Hungary. His parents moved to Vienna when he was four, and there he studied as a youth in the physiological laboratories under Bruecke and later at the Institute for Cerebral Anatomy. He was awarded his medical degree in 1881. In 1884 Dr. Josef Breuer, a Viennese physician, related to him the unusual case of "Anna O.," a young girl suffering from paralysis who had been

cured after recollecting, in a state of hypnosis, the origin of her symptoms. Freud, deeply impressed, went on to reconstruct the fundamentals of psychoanalysis. He went to Paris in 1885 to study under the French neurologist and hypnotist, Jean Charcot; upon his return to Vienna the next year he set up his practice and by 1895, when he collaborated with Breuer on *Studies in Hysteria*, he had definitely formulated the basic principles of psychoanalysis. Essentially these principles remained unchanged throughout his later years of research; they set forth the existence of powerful subconscious thought with its resulting "repressions" and "inhibitions" and the all-important role of the "libido," or sexual instinct, which accounts for such neuroses as the "Oedipus complex" or for great creative ability through "sublimation." After 1906 Freud was joined by other psychologists, notably Brill, Adler, and Jung, and in 1908 the first International Congress of Psychoanalysis was held. Both Adler and Jung later seceded from the Freudian school, however, Adler holding that not sexual desire, but a desire for superiority, is the mainspring of human behaviour.

The majority of Freud's works have been translated into English. One of the most famous is *The Interpretation of Dreams*, first published in 1901. In 1939, shortly before his death, he published *Moses and Monotheism*, in which he psychoanalyzed anti-Semitism and related the hatred of Jews to hatred of monotheism. His books were publicly burned in Germany after the Nazis' advent, and in June 1938, after the Austrian Anschluss, he moved to London, where he continued active research and directorship of the *International Journal of Psycho-Analysis*. Dr. Freud, who had been suffering for several years from advanced cancer, died September 23 at the home of his son, Ernst Freud, in Hampstead, England. For a biography, see *Encyclopædia Britannica*, vol. 9, pp. 836-7; see also Freud's article PSYCHOANALYSIS, vol. 18, pp. 672-4.

Fritsch, Werner von (1880-1939), German soldier, was born at Benrath, Silesia, on August 4, the son of an army officer. At the age of 18 he joined an artillery regiment and in 1900 he was commissioned lieutenant. During the World War he was a general staff officer with the rank of major and was decorated with both the Iron cross, first and second class, and the Order of Hohenzollern. In 1922 he was advanced to lieutenant colonel and shortly afterward entered the ministry of defence as a colonel. In Oct. 1931 he was appointed to command of the First Cavalry division with the rank of major general; by October of the following year he was lieutenant general. Hitler appointed him in Feb. 1934 chief of staff of the German Army with the rank of general of artillery. Von Fritsch was apparently unenthusiastic about Nazi plans for a vigorous foreign policy, and in the army "purge" of Feb. 1938 he resigned and was replaced as commander-in-chief of the German Army by Gen. von Brauchitsch (*q.v.*). Hitler, however, was not unmindful of his general's excellent accomplishments in rebuilding Germany's military machine, and shortly after the "purge," the Fuehrer publicly conveyed to von Fritsch his "honest thanks for the work you did in the reconstruction of our defence force." When Germany invaded Poland in Sept. 1939 von Fritsch, though still retaining his rank of colonel-general, was placed in honorary command of an artillery regiment, and it was in this subordinate post that he was killed in action September 22, according to the Germans, "in the course of an offensive reconnaissance patrol before Warsaw."

Fruit: see APPLES; BANANAS; GRAPEFRUIT; GRAPES; LEMONS AND LIMES; ORANGES; PEACHES; PEARS; PINEAPPLES; PLUMS AND PRUNES.

Fuel: see COAL INDUSTRY; GASOLINE; NATURAL GAS; PETROLEUM.

Fuel Briquettes. The compression of finely divided or low grade coal into briquettes, to make it more adaptable as a fuel, has grown to an industry of considerable magnitude in a number of countries, especially those having large supplies of low grade coals. Some of the leading outputs in 1937 were as follows: United States 1,036,000 metric tons; Belgium 1,849,000 tons; Czechoslovakia 724,000 tons; France 7,957,000 tons; Germany 48,727,000 tons; Netherlands 1,327,000 tons. Total world production is estimated at 64,261,000 tons. In all of the leading European producing countries briquettes have an important place in export fuel trade; both France and Germany have net exports in excess of a million tons, while Belgium stands at about half that figure; Czechoslovakia had a small export surplus, but in Netherlands imports exceed exports. Imports into the United States are negligibly small, and exports are only slightly greater, chiefly to Canada. Although little of the United States output is exported, domestic consumption is widely distributed, shipments having been made in 1937 to 36 States, Alaska, and the District of Columbia. Included in the briquette output reported above, there was produced in 1937 in the United States 132,400 short tons of briquettes wrapped in paper for convenience and cleanliness in handling, the product being commercially known as "packaged fuel."

(G. A. Ro.)

Fulda, Ludwig (1862-1939), German novelist, playwright, and translator, was born on July 15. He was educated at Berlin, Leipzig, and Heidelberg and received his doctorate from the latter university at the age of 21. Two of his plays were produced in New York city during the '90s and he became one of Germany's leading playwrights prior to the World War (1914-18). Fulda devoted much of his time to making the German theatre more cosmopolitan; he translated the works of Rostand, Molière, Ibsen, and the Spanish classical dramatists into German. At the time of his death he was honorary president of the International Confederation of Societies of Authors and Composers. Among his works were *Maskerade* (1904), *Der Vulcan* (1920), *Die Gegenkandidaten* (1923), and *Fraülein Frau* (1929). His two plays produced in America were *The Talisman* (1894) and *Old Friends* (1899). Though Jewish, Fulda did not leave Germany after the Nazis' rise to power. With Thomas Mann, Franz Werfel, and others, he was forced to resign from the Prussian Academy of Arts in 1933 and thereafter lived quietly in Berlin, where he died on March 30.

Fuller's Earth. Almost the entire output of fuller's earth is used in the bleaching of refined petroleum or other oils and fats, its original use in the cleansing of cloth having practically disappeared. The United States production had for several years stood at 200,000-230,000 short tons, after a decline of about one-third, but in 1938 dropped to 171,000 tons, in spite of increasing petroleum outputs. These decreases have been due to increased efficiency in use, the development of methods of re-activating the clay after use, and to substitution by other bleaching agents, especially bentonite.

(G. A. Ro.)

Furniture Industry. America's 2,200 furniture factories regained most of the volume they lost in 1938 and finished 1939 with a total of approximately \$450,000,000, still 25% below 1929. Employment also increased to 115,000 men and wages advanced 6%, bringing annual wages for the industry to \$100,000,000. Back of the rapid recovery of the furniture industry was America's 1939 home building boom, the greatest in ten years.

Principal woods used by the furniture industry include mahogany, walnut, maple, oak, birch and aspen. Public style prefer-

ences determine which woods will be used. The present 18th century vogue makes mahogany more popular than formerly. Very little gum wood furniture is produced now. A survey of the June (1939) markets in Grand Rapids and Chicago showed the following woods used:

	1939 %
Walnut	33.0
Mahogany	31.7
Maple	7.6
Oak	3.1
Orientalwood	3.0
Philippine woods	2.5
Aspen	1.0
Satinwood	1.5
Enamel	1.2
Miscellaneous solid woods*	3.5
Miscellaneous veneers†	9.1
Imitations	2.8
	<hr/> 100.0

*All domestic and foreign solid woods not separately listed above.
†All domestic and foreign veneers not separately listed above.

The following shows the elements of cost for each \$100 worth of furniture produced in 1938:

Materials (Lumber, finishing materials, etc.)	\$40.80
Direct Labour	22.84
Factory Overhead	18.77
Sales Expenses	10.00
Administrative Expenses	7.49
Total Costs	<hr/> \$99.90

Abroad.—England supplies most of the better furniture used in South America and has about 100 large factories and several thousand small ones. Canada has about 100 furniture factories and imports both American and English furniture. France has 50 large furniture factories, most of its plants being small. Germany has approximately 150 large furniture plants and more than 1,000 small ones. Her market is largely through Central Europe. As a result of the European war, the United States may expand its furniture market in Canada, South America, and Mexico. (J. A. G.)

Furs. The fur trade was inactive and unprofitable during the first half of 1939. In London, New York, Montreal, Paris, Oslo, Sydney, Shanghai, Tientsin, all important fur markets, the approaching war in Europe overshadowed all other events, political and economic. Fur skin prices during the late winter and spring of 1939 were easy and were little, if anything, above the prices ruling at the end of 1938.

The picture changed when war was declared in Europe. For a while there was a little confusion, but the American trade, remembering the experiences of the previous great war, kept its head and speculative tendencies were quickly curbed. Prices were held down, even though consumer demand increased steadily during the fall and winter months. Retail sales of fur during the second half of 1939 averaged about 25% more than in the corresponding period in 1938. A much larger volume of furs was actually sold at wholesale than in 1938, but low prices prevented any noticeable gain in wholesale dollar volume.

Stocks of fashionable furs, such as muskrat, beaver, Chinese kid, fitch, marmot, skunk, broadtail, lynx, marten showed moderate price gains towards the end of 1939. Other fur skins failed to show any advance in price, as compared with 1938. The jacket style of garment sold in the greatest volume. The brown- or mink-dyed furs gained in popularity. Silver fox, mink, Persian lamb (black and gray), mink-dyed muskrat, skunk, beaver, brown-dyed fitch and squirrel were the "furs of the year."

United States imports for the period Dec. 1938 to Oct. 1939 were valued at \$46,727,841, or \$3,253,523 more than for the corresponding period in 1937-38. Increased quantities of beaver,

rabbit, hare, kolinsky, mink, muskrat, opossum, squirrel, weasel, and silver fox were imported. Other items remained at practically the same import figures as in 1938. The principal sources of supply were Russia, Canada, Great Britain, China, and Australia, and France for rabbit fur.

The duty on silver fox imports was reduced from 50% to 37½% on Jan. 1, 1939. The U.S. imported over 85,000 silver fox, principally from Canada and Norway. The American fur breeders appealed to the U.S. Government to limit the imports of silver fox skins from foreign countries to 100,000 skins for the season of 1939-40. Closing of European markets threatened to result in the dumping of silver fox skins in the American market. Prices on silver fox fell 25% in Dec. 1939 and 35% on ranch mink, compared with Dec. 1938. Fur exports totalled, for the Dec. 1938 to Oct. 1939 period, \$11,957,346, or \$1,226,651 less in value than in 1938. The number of skins exported, however, was greater with more muskrat, raccoon, and opossum shipped abroad than in 1938.

Insolvencies in the American fur trade up to the end of Nov. 1939 totalled 186 cases. In New York city area there were 128; elsewhere 58. The total of failures was higher than the 1934-38 average of 149. Liabilities amounted to \$3,624,114.

The International Fur Workers Union succeeded in organizing the employees in the fur merchants and skin dealers branch of the trade. At the opening of the new raw fur season in Nov. 1939, the American fur trade faced the problem of probably having to handle a much greater proportion of the world's fur skins than ever before. The market of Europe, which annually consumes more than half of the world's fur production, ceased to function normally on the outbreak of war.

Governments placed drastic restrictions on fur imports and exports. There developed the possibility of enormous quantities of fur merchandise coming to New York, since it was at the end of 1939 the only "free" market. Evidence of this in the flight of foreign capital from Europe to New York, some of it in the form of fur merchandise, created a serious problem for the American fur trade. It brought a definite weakening of pelt prices late in the year. The United States, under favourable conditions, could consume as much as 55% of the world's peltries, but any quantities over and above this will cause serious overloading of the American market. (W. J. Bt.)

Gambia: see BRITISH WEST AFRICA.

Gamelin, Maurice Gustave (1872—), French soldier and, since June 6, 1939, supreme commander of all French armed forces. Son of a general, he was born in Paris and educated at St. Cyr. He was chief of staff of Gen. Joffre in 1914 and played an important part at the battle of the Marne; it was he who was reputedly most insistent in his prophecies that Germany would invade France by way of Belgium. During the course of the World War he was promoted general of brigade and in 1917 commander of a division. After the war he was head of a military mission to Brazil until 1925, when he was appointed commander of French forces in the Levant. He became chief of the general staff in 1931 and vice-president of the general council of war and inspector-general in 1935. During the several crises of 1938 and 1939 he was responsible for the partial French mobilizations; in Sept. 1938 he expressed the view, in a report to Premier Daladier, that France should intervene in the German-Czech crisis despite several shortcomings in military preparedness. After France declared war on Germany Sept. 3, 1939 Gamelin proceeded with caution, apparently wishing to avoid "another Verdun" at Germany's Westwall and to conduct slow offensives with a minimum loss of manpower.

Gandhi, Mohandas Karamchand (1869–), Hindu nationalist leader, was born at Porbandar (Kathiawar), India. For his biography, see *Encyclopædia Britannica*, vol. 10, p. 15. After the elections for the provincial legislatures in 1937 had resulted in the Congress party's gaining a majority in six provinces, Gandhi recommended that the party accept office if assurances were given that the governors would not use their veto. At Madras on Jan. 22, 1937, Gandhi announced his retirement from active Indian politics, but in 1939 he achieved two notable political victories. In the first he employed his famous weapon of "fast unto death" to protest against the administration of the Thakore Saheb of Rajkot. After Gandhi had passed four days (March 3-7) without food, the ruler of Rajkot capitulated, and the British viceroy, the marquess of Linlithgow, agreed to submit the dispute to the Indian chief justice. His second victory came on April 29 when his opponent, Subhas Chandra Bose, was forced to resign as president of the Congress and was replaced the next day by Rajendra Prasad, a disciple of Gandhi. It was evident from events of the year, that Gandhi's political influence, which had apparently been waning, was again in the ascendancy. He added his bit to international efforts for peace in September when, according to reports, he dispatched a personal appeal to Hitler. After hostilities broke out, Gandhi sought a declaration of British war aims concerning India and demanded Indian independence at the end of the war. Irritated at what he apparently considered temporizing statements by the British viceroy, Gandhi, through the India Congress, ordered eight provincial ministries to resign in protest October 22.

Garbage and Waste Disposal: see PUBLIC HEALTH ENGINEERING.

Gas, Natural: see NATURAL GAS.

Gas-Electric Bus: see ELECTRIC TRANSPORTATION: *Self-contained Electric Units*.

Gas Masks: see CHEMICAL WARFARE.

Gasoline. The production and utilization of gaseous fuel in European countries was greatly expanded in 1939, partly because of the impetus given by the war and partly because of the fruition of programs launched some years ago to build up supplies as a substitute for motor fuel from petroleum. In these countries coal and lignite are the important raw materials used. While this development, induced by the dependence of these countries on outside sources for fuel, went on apace, in the United States there was great expansion of manufacture and use of gaseous fuel, derived from petroleum and natural gas. It is interesting to note that whereas in Europe the products of coal carbonization are developed largely as a substitute for petroleum products, in the United States processes not always wholly dissimilar are applied to petroleum as the raw material, and that the resultant gaseous fuel not only may be directly used as fuel for motor cars or for heat and cooking but also is providing spectacular results in making available in commercial quantity high octane-number aviation fuels.

Germany's production of synthetic gasoline from coal and lignite is unofficially estimated at 12,750,000 bbl. in 1938, a fivefold increase over 1933, and further increase is anticipated in 1940 with the completion of the first units of the world's largest synthetic gasoline plant being built near Stettin for the conversion of oil residues and Silesian coal into motor fuel. (See PETROLEUM.) Germany has been engaged in supplying a large part of her fuel requirements from coal products for several years, the industry being under Government protection and subsidy. At most she succeeded in supplying no more than 25% or 30% of her normal requirements from this source; but this greatly exceeds the ac-

complishment of any other country. In England gasoline from coal represents only about 4% of the United Kingdom's motor fuel requirements. The industry has been developed under Government subsidy.

France and Belgium also have subsidized this development but the production represents but a relatively small per cent of total motor fuel requirements. The United States has practically unlimited coal reserves available as motor fuel sources. While a substantial production of benzol as a motor fuel derived from coking operations is obtained, the total is insignificant as compared with gasoline obtained from petroleum.

In the meantime in the United States a large by-product industry utilizing petroleum gases has been built up. This "bottled gas" goes into suburban and rural homes as fuel for cooking, heating and refrigeration. Chiefly supplied from natural gas, in the production of natural gasoline, and from refinery gases, these gases are generally liquefied under moderate pressure so as to facilitate storage and transportation. The product also is used as a fuel in motor buses and rail cars.

Gaseous hydrocarbons, natural gas and refinery gas are becoming increasingly valuable as charge stock at petroleum refineries for the production of gasoline and particularly of high octane or aviation fuel. This began with the now well known polymerization process. Normally gaseous hydrocarbons, because of their high volatility, find only a limited use in gasoline; but it has been determined through the polymerization and other processes that they are capable of being transformed into high octane fuels of very great value.

There were in 1939 between 50 and 75 polymerization units operating in the United States.

Announced in 1939 was the sulphuric acid alkylation process representing the combined efforts of the Anglo-Iranian, Humble Oil, Shell Development, Standard Development, and Texas companies' research staffs. These companies, working independently, had developed processes which, though somewhat different in details of operation and in the results obtained, were in principle essentially similar. It was announced that in the best interest of the petroleum industry as a whole and in order that a major new source of high octane aviation fuel should be made available for national defence without delay or waste of correlative experience, their efforts had been combined to expedite the commercial application of the process.

This process affects directly the union of isoparaffins with olefins in approximately equal volumes to form branched-chain paraffins in the presence of strong commercial sulphuric acid as the catalyst, and in a single-stage operation. Thus a new source of high octane gasoline is available, and, with sufficient isoparaffin, potential yields of branched-chain product by alkylation from a given refinery stream are more than double those obtainable by the existing two-stage process of olefin polymerization followed by hydrogenation. Standard materials of construction are used in the six alkylation plants in operation in 1939 and the others under construction.

The catalyst is of universal availability.

Another commercial catalytic process has been developed which adds enormously to the potential gasoline supply for aviation and motor vehicle use. This is the catalytic dehydrogenation process and applies to the conversion of gaseous paraffins, except methane, into the corresponding olefins and hydrogen. The paraffins are derived from natural gas, casing-head gas, refinery gases and gases from other sources such as coal.

U. S. Consumption.—The year 1939 goes down as a record-breaker in motor fuel or gasoline consumption in the United States. Preliminary estimates for the year show a domestic motor fuel demand of more than 551,000,000 bbl. compared with 523,-

103,000bbl. in 1938, an increase of 5%.

In 1937 domestic demand totalled 519,352,000bbl. and in 1936, 481,606,000 barrels.

The effect of the war in Europe on American gasoline manufacture and exports is yet to be determined. While the Allies are expected heavily to increase their buying, the fact remains that gasoline consumption for non-military purposes in Europe is greatly restricted and normal supplies to fill this need will not be required.

Tankers to move American gasoline in belligerent waters must be provided, as under the United States Neutrality Act American ships must keep out of war zones.

It is to be presumed that Allied demand for gasoline will be largely concentrated on high octane motor fuel for aviation purposes. In the United States also a great expansion of military and civilian aviation is being launched.

This specialized demand in the U.S. and Europe has resulted in a speeding up of development of aviation fuel processes by American refineries.

Six new methods of producing aviation fuel base stock or high octane blending materials were discussed at the annual meeting of the American Petroleum Institute in Nov. 1939. These are thermal and catalytic alkylation, Houdry catalytic reforming, catalytic dehydrogenation of gaseous paraffins to olefins and two processes for complete desulphurization. Also considerable importance was attached to improved tetra-ethyl lead response of these gasolines in boosting octane number.

The importance of these processes to aviation cannot be over-emphasized. Higher octane fuel generally available means to the aeroplane greater speed, less fuel to be carried, greater range and greater load-carrying capacity. In the last two or three years new refining processes have enabled the oil industry to make commercially available 87 octane-number aviation fuel. Now the aim is to provide 100 octane fuel. In 1939 aviation fuels with octane ratings approaching 100 and above were increased greatly in commercial availability. In 1937 the domestic consumption of 100 octane aviation fuel was approximately 7,000,000gal., and it has been estimated this increased to 20,000,000gal. in 1938.

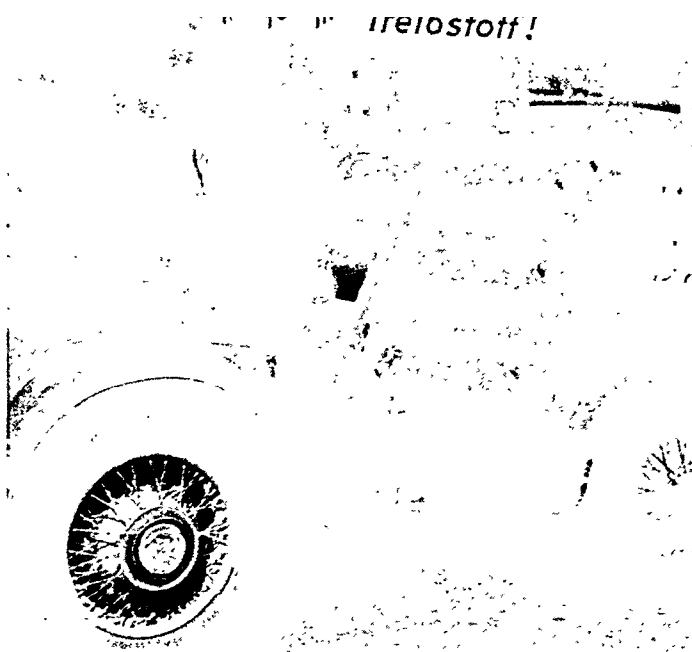
The anticipated consumption for 1939 and 1940 is greatly in excess of these figures, and with the assurance of a larger supply of 100 octane fuel at a reasonable price, a further increase undoubtedly will result from changes in aeroplane motor design to take advantage of the better performance and economy possible when operating with such a gasoline.

World Consumption.—By far the greatest consumption of gasoline is by motor vehicles. The United States, with over 65% of the world's registered motor vehicles, needs and consumes by far the greatest quantity. Other countries on the Western Hemisphere account for 5.12% of the world's motor vehicle registration; Europe, for 20.9%; Africa, for 1.5%; Asia, for 1.5% and Oceania, for 2.6%; this being an indication of the relative geographic consumption of gasoline.

In the United States increased motor vehicle consumption of gasoline is expected to continue. On top of that is the evident tremendous increase in aviation consumption in the United States and in Europe, with American refineries being called upon to supply the major part of that demand.

It is estimated that about 90% of all gasoline consumed in the United States is by motor vehicles. Aviation gasoline consumption totals only about .4% of the entire gasoline consumed, divided as follows: For commercial aviation .24%, and for the Army Air Corps, National Guard, Bureau of Aeronautics, Navy Department (including Marine Corps), U.S. Coast Guard and Bureau of Air Commerce, .16%.

Gasoline consumed by agriculture in the United States accounts



WOOD-BURNING TRAILERS attached to German motor cars convert combustion gases into fuel for the car

for 5.53% of the total gasoline consumption, divided as follows: For tractors 4.42% and for other farm uses 1.11%. Highway construction agencies consume 1.03% and other construction operations 1.06%. About .3% is consumed by manufacturing industries; .28% by the U.S. Government; .08% for dry cleaning; .02% by the railroads. Use of gasoline by boats is extensive but only a small percentage of the total gasoline consumed, about .16%.

Undoubtedly the most significant development in gasoline consumption is the expansion of aviation resulting from war and war preparation and the resultant effect it will have on establishing civilian and commercial aviation on a plane possibly comparable to the expansion of the use of the automobile during the last quarter century. (See also PETROLEUM.)

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Gaster, Moses (1856-1939), British-Rumanian Hebrew scholar and linguist, was born in Bucharest. Educated at Bucharest university and at the University of Leipzig, where he received his Ph.D. in 1877, Gaster was expelled from Rumania in 1885 for protesting vigorously against the Government's anti-Semitism. Years later, when he had attained renown as one of the foremost scholars of his day, Rumania awarded him the Order of Merit and invited him to return to Bucharest, but he declined. Establishing his residence in England in 1886, he delivered the Ilchester lectures at Oxford on Slavonic and Byzantine literature. He took an active part in English and Jewish political life and was thrice vice president of the Zionist congress at Basle and London. From 1887 until his retirement in 1919 he was chief rabbi of the Sephardic Communities of England. He was an officer also of the Folklore Society of England, the Anglo-Jewish association, and the Royal Asiatic society and a Fellow of the Royal Society of Literature. He was author of many volumes and articles on philological, historical, and Biblical subjects. He died March 5 while motoring from Oxford to Reading. A biographical notice of Gaster appears in *Encyclopædia Britannica*, vol. 10, p. 54.

Gates, Milo Hudson (1866-1939), U.S. Protestant Episcopal clergyman, was born June 29 at Gardner, Mass. From 1907 to 1929 he was vicar of the Chapel of the Intercession, Trinity parish, New York city, and he was dean of the Cathedral of St. John the Divine in New York city from 1930 until his death on Nov. 27, 1939.

Gay, Frederick Parker

(1874-1939), U.S. pathologist and bacteriologist, was born at Boston on July 22. He was educated at Harvard and at Johns Hopkins, where he received his medical degree in 1901. After teaching at the University of Pennsylvania, Harvard, the University of California and other institutions he joined the faculty of Columbia university, where he taught bacteriology until his death. He was noted for his researches into typhoid fever, sleeping sickness, immunity, and the effect of the new drug sulphanilamide upon streptococcus infections. Among his publications were *Studies in Immunity* (1909) and *Typhoid Fever* (1918). He died at New Hartford, Conn., on July 14.

General Federation of Women's Clubs: see WOMEN'S CLUBS, GENERAL FEDERATION OF.

Genetics.

The seventh International Congress of Genetics convened in King's Buildings, University of Edinburgh on Aug. 22, 1939. Dr. F. A. E. Crew was elected president. In attendance were over 500 delegates, from all the civilized world. On the program were over 350 papers. Because of the international crisis most of the delegates other than British and American left within three days.

Cytogenetics.—Using the larval tail-tips of the salamander, *Eurycea bislineata*, Fankhauser has extended his significant studies on polyploidy in the amphibians. Following the discovery of Eigsti that treatment with the drug, colchicine, induces polyploidy in plants, workers in 1939 reported chromosome doubling by use of this drug on pine, wheat, oats, barley, tobacco, buckwheat and onion.

By colchicine treatment Smith, Warmke and Blakeslee have obtained fertile tetraploid hybrids in crosses of *Nicotiana* (tobacco) species, which normally give sterile hybrids. Sears has obtained similar results in grasses. Goodspeed and Avery have made a comprehensive report of trisomics and other chromosomal variants in *Nicotiana glauca*. Kaufmann has made a detailed study of the several types of intra and interchromosomal rearrangements following X-raying in *Drosophila melanogaster*. He reports non-random breakage along the X-chromosome. The morphology and inversions of the salivary chromosomes of natural populations of *Drosophila azteca* have been investigated by Dobzhansky and Socolov, and of *Drosophila algonquin* by Miller.

Genetics and Evolution.—There has been a definite trend from strictly laboratory toward field-laboratory investigations in experimental evolution on the combined basis of ecology, genetics and cytology. Gene frequencies in natural populations of *Drosophila melanogaster* have been analyzed by Plough and Ives; similar studies have been carried on by Dobzhansky in *Drosophila pseudoobscura* and by Gordon, Spurway and Street in *Drosophila subobscura*. Important cytological investigations on hybrids in *Drosophila virilis* subspecies have been reported by Hughes; on *melanogaster simulans* by Horton; and on *Sciara* species by Metz and Crouse. Anderson has demonstrated limited recombination of factors for corolla shape and colour in *Nicotiana* species crosses.

Human Genetics.—New pedigrees of human inheritance too numerous to mention have been published. In answer to the question, "How could the world's population improve most effectively genetically?" 21 leading geneticists attending the International Congress signed a statement containing in brief the following: genetic improvement of the race depends on major changes in social conditions and correlative changes in human attitudes; on removal of race prejudices; on economic security for parents and particularly for mothers; on the legalization and practice of birth control, both negative and positive; and on a wider knowledge of fundamental biologic principles.

New Books.—*An Introduction to Genetics*, Sturtevant and Beadle, is particularly strong in its presentation of the intricacies of chromosome structure and behaviour. *An Introduction to Modern Genetics*, by the British embryologist, Waddington, presents genetics in relation to embryology, evolution and human affairs. Muller has published a comprehensive *Bibliography of the Genetics of Drosophila*, including 2,965 titles. Complete through 1938, this bibliography is invaluable to the student of theoretical genetics.

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Geographical Society, American: see AMERICAN GEOGRAPHICAL SOCIETY.

Geology.

As a result of the increasing number of applications and adaptations of geology to mineral exploration and engineering projects it is becoming more quantitative in character.

Geomorphology.—Within the past few years this branch of geology has become definitely established in America. During 1939 two important textbooks appeared, namely: *A Textbook of Geomorphology* by Worcester and *Geomorphology: An Introduction to the Study of Landscapes* by Lobeck.

Physical Geology.—Several significant short papers on various phases of physical geology and three revisions of widely used American texts appeared in 1939.

Historical Geology.—The usual number of contributions dealing with the geologic history of local areas were published during 1939. An excellent text by Wells with emphasis on the geology of the British Isles was issued in London. A valuable theoretical contribution by Grabau on the Ordovician formations of the Caledonian geosyncline appeared as volume 4 of the series entitled *Paleozoic Formations in the Light of the Pulsation Theory*.

Palaeontology.—Continued interest in micropalaeontology is manifested by the issuance of numerous descriptive papers and bibliographies. Of particular interest is the detailed catalogue of the Foraminifera nearing completion under the direction of Brooks F. Ellis. During 1939 there was published a notable book by Raymond entitled *Prehistoric Life*. An excellent treatise on *Principles of Paleobotany* by Darrah, representing volume 3 of the *New Series of Plant Science Books*, was published in Holland. Of importance to vertebrate palaeontologists is the new book on *Paleozoic Fishes* by Moy-Thomas.

Sedimentology.—In recent years the necessity for obtaining detailed information on sedimentary processes has been appreciated. In accord with this trend two important symposia on recent sedimentation came from the press. "Sediment-Heft" (*Geol. Rundschau*, volume 29) presents the results of European investigations. *Recent Marine Sediments* edited by Trask under the auspices of the National Research Council includes important American contributions. The appearance of a *Textbook on Sedimentation* by Twenhofel emphasizing environmental conditions marks an important step forward.

Structural Geology.—Emphasis is being placed on the broader aspects of the earth as a whole. The *Architecture of the Earth* by Daly (1938) synthesizes the causes and results of deformation and vulcanism as inferred from seismic studies and geologic field data. A series of papers, edited by Gutenberg, appeared in *Internal Constitution of the Earth*, comprising volume 7 of the *Physics of the Earth Series*, a National Research Council project.

Regional Geology.—The first of a three volume reference work, entitled *Geology of North America*, edited by Ruedemann and Balk, appeared. Eastern North America including Greenland is described.

Mineralogy.—Investigations on the atomic structure of rock-forming silicates have shown continued progress. A compilation of new mineral names with citations to the original literature and diagnostic physical properties was published by English as *Descriptive List of the New Minerals 1892-1938*.

Petrology and Petrography.—The two significant trends in petrology appear to be the emphasis on phase relations of minerals in metamorphic rocks and on petrofabric analysis with the Universal stage. A *Manual of Sedimentary Petrography* by Krumbein and Pettijohn (1938) gives statistical methods and procedures in the mechanical analysis of sediments.

Economic Geology.—Attention has been focused on strategic minerals as a result of the unsettled world conditions. The United States Government appropriated funds for studies of domestic reserves of chromium, manganese, tungsten, tin and other minerals essential to national economy. The recent appearance of *Strategic Mineral Supplies* by Roush is timely. In the field of petroleum geology the discovery of oil in commercial quantities in Mississippi and Nebraska and the rapid development of new productive areas in the Illinois basin were outstanding events. The research committee of the American Association of Petroleum Geologists has been active in stimulating studies of the so-called stratigraphic traps. A well rounded text entitled *Les Gisements de Petrole* by Macovei was published in Paris in 1938.

Engineering Geology.—The importance of geology in construction and reclamation work is receiving greater recognition. A new text *Geology and Engineering* by Leggett emphasizes the value of geology in large scale construction and underground operations.

Seismology.—*Studies on the Periodicity of Earthquakes* by Davison marks an important contribution in this field.

Geologic Lexicons and Source Books.—*Geology and Allied Sciences* by Huebner gives the German equivalents and definitions of 25,000 English geologic terms. *Lexicon de Stratigraphie: Africa*, vol. 1 (1938), edited by Haughton, gives the names, lithology and characteristic fossils of African stratigraphic units. The *Lexicon of Geologic Names of the United States* by Wilmarth, published by the United States Geological Survey (1938), gives essentially the same data for geologic units in North and Central America, Alaska and Hawaii. A *Source Book in Geology* by Mather and Mason presents collateral readings from the works of outstanding contributors to geologic science up to 1900. *Birth and Development of the Geologic Sciences* (1938) by Adams is a more academic work dealing with geologic concepts in ancient and mediaeval times and supplements the classics of von Zittel and Geikie. (See also MINERALOGY; PALAEOLOGY; SEISMOLOGY.) (F. M. V. T.; J. C. HF.)

George VI (1895–), King of Great Britain and Ireland (see *Encyclopædia Britannica*, vol. 10, p. 191), in his 44th year and the third of his reign, had forced on him the sad duty of leading his Empire at war. Both before and after its outbreak he paid many visits to establishments of all the armed forces, to armament works, anti-aircraft, A.R.P. and nursing

centres, etc.; early in December he spent some days inspecting the British Expeditionary Force in the front line in France; while by his speeches at the prorogation (November 23) and opening (November 28) of parliament no less than by his broadcasts on September 3 and Christmas Day he further encouraged his peoples in their determination to meet—in his own words—“the challenge of a principle which, if it were to prevail, would be fatal to any civilized order in the world.”

Earlier in the year among a number of State engagements such as the launching of the 35,000-ton battleship “King George V” at Newcastle (February 21), visits to the British Industries Fair, and the opening of the rebuilt Westminster hospital (April 30), there were two outstanding events, viz., the state visit of the President of the French Republic (March 21-24) and the royal tour in Canada and the U.S.A.

The former was a return for the reception accorded to King George and Queen Elizabeth in Paris in 1938, and was a diplomatic as well as a great social success; the latter was the first occasion on which any British monarch had acted as such in any of the sister Dominions of the Empire, and during it for the first time in history the United States Congress received a foreign king.

Two days before their tumultuous send-off from Portsmouth (May 6) the King and Queen were entertained at dinner by the American ambassador, and from their arrival at Quebec (May 17—two days late on account of weather conditions) until their return, the tour was a succession of enthusiastic demonstrations both on the part of the King's subjects and the citizens of the United States. It led from Quebec to Montreal, Ottawa, Toronto, Winnipeg, Calgary and across the Rockies to Vancouver and Victoria, B.C.; thence back via Edmonton and Saskatoon to Winnipeg and so to Niagara Falls whence (June 7) the royal party entered the United States and proceeded to Washington.

On the following day the King and Queen, after a British Embassy garden-party, attended a State dinner and reception at the White House; on the 9th came their reception at the Capitol, visits to Mount Vernon and the Arlington National Cemetery, and their departure for New York city where, especially en route to the World's Fair, on the 10th they received an ovation which in cordiality, sincerity and spontaneity was unsurpassed during the tour. A quiet stay at the President's home, Hyde Park, preceded the return to Canada, and after further loyal receptions in New Brunswick, Nova Scotia and Newfoundland, the King and Queen embarked at St. John's on June 17 on the return journey, reaching Southampton on June 22 and rounding off the memorable episode with an historic speech at the London Guildhall on June 23 and attendance at a thanksgiving service in Westminster Abbey on July 2.

The remainder of the year was spent entirely, as mentioned above, in duties connected first with the crisis and then with the war itself; and among other griefs that he suffered at this time were the long separation (end-August to Christmas) from his children, the Princesses Elizabeth and Margaret Rose, and the death (December 3) of his great-aunt, Queen Victoria's fourth daughter, Princess Louise, at the age of 91. (See also CANADA: *Tour of the King and Queen*; UNITED STATES.) (L. H. D.)

Georgia, one of the original States of the United States, popularly known as the “Empire State of the South”; area 59,262 sq.mi., being the largest east of the Mississippi river; population according to the U.S. census of 1930, 2,908,506, estimated July 1, 1937, 3,085,000. Capital, Atlanta, 270,366, estimated July 1, 1937, 280,400. The next largest city is Savannah, 85,024. Of the State's population 895,492 are urban, or 30%; 1,836,924 whites; 1,071,125 coloured; 407 other races; 13,917 foreign-born.

History.—E. D. Rivers, elected governor in 1936, on a program of support of the New Deal, was renominated in the primary of Sept. 14, 1938. In his campaign he sought endorsement for what he had done during his two-year term and an opportunity to complete his program.

The county unit system of voting prevails, whereby the smaller counties have one vote each and the most populous only three. Rivers received 282 unit votes, his opponents Hugh Howell and John J. Mangham securing 126 and 2 respectively. In the election in November 1938 the Democratic ticket had no opposition as the Republicans seldom make nominations for State offices. The principal State officers were: E. D. Rivers, governor (Dem.); John B. Wilson, secretary of State; M. J. Yeomans, attorney-general (he resigned during the year and was succeeded by Ellis Arnall); George B. Hamilton, treasurer; Zach Arnold, auditor; William B. Harrison, comptroller; M. D. Collins, superintendent of schools, and Columbus Roberts, commissioner of agriculture. The chief justice of the Supreme Court, Richard B. Russell, Sr. died in 1938 and was succeeded by Charles S. Reid. The campaign for renomination of Senator Walter F. George was of national significance on account of President Roosevelt's attempt to "purge" him, in his Barnesville address, in Aug. 1938. He was opposed by Lawrence Camp, the President's choice, and by Eugene Talmadge, a bitter critic of the President. George won with 246 unit votes, Camp receiving 16 and Talmadge 148. In the election in November 1938 he was unopposed.

Banking and Finance.—For the year ending June 30, 1939, the common schools received \$11,645,000; the various eleemosynary institutions, \$3,154,000; and the University system (embracing all higher educational institutions supported by the State), \$1,768,000. The State appropriated for the Public Health Department and the tuberculosis hospital \$826,000. The Highway Department received \$14,773,000. The total revenues received for the same period amounted to \$43,519,000, the tax on motor fuel producing the largest amount, \$20,529,000. Other important sources were the income tax, \$4,979,000; the general property tax, \$4,941,000; cigar and cigarette tax, \$2,761,000; motor vehicle registration, \$1,875,000; insurance premium tax, \$1,165,000; malt beverage and wine tax, \$1,342,000; and alcoholic beverage tax, \$1,669,000. Poll taxes amounted to \$261,000. Georgia received from the United States Government grants amounting to \$11,868,000. The bonded debt was \$3,569,000. In 1939 there were 240 State banks with resources of \$179,420,000.

Agriculture.—In 1935 there were 250,544 farms and 164,331 croppers and tenants. In 1939 the principal crops were cotton, 916,000 bales; tobacco, 96,620,000 lbs.; sweet potatoes, 8,892,000 bu.; Irish potatoes, 1,386,000 bu.; corn, 36,941,000 bu.; wheat, 1,770,000 bu.; oats, 8,946,000 bu.; apples, 450,000 bu.; peaches, 4,290,000 bu.; sugar cane sirup, 1,024,000 gal.; pecans, 8,700,000 lbs.; peanuts, 341,250,000 lbs.; and watermelons, 9,390,000. The total value of the main crops produced in 1939 was \$141,933,000, 6% below the value for 1938.

In 1939 the State had 970,000 cattle, 1,554,000 hogs, 31,000 horses.

The Census of Manufacturing of 1937 credited Georgia with a total value of \$708,652,000, about five times the value of the agricultural output. Since the raw materials of manufacturing are, however, largely agricultural in origin, a fairer comparison is that with "value added by manufacturing." In 1937 this value was \$269,500,000, less than double the agricultural output, but still significant of trends in a primarily agricultural state.

(R. P. BS.)

Georgian S. S. R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

German-American Bund

is the successor of an organization known as the Friends of the New Germany. Fritz Kuhn got control of it in 1936 and changed its name and reorganized it. Kuhn is a native of Germany, served in the German Army and was with Hitler in the abortive beer hall putsch in Munich. He has been an American citizen for about 18 years and when he took control of the organization he was working in the chemical department of the Ford Motor Company in Detroit. The Bund, as described by its publicity director, "is an organization of United States citizens, in the main of German extraction, accepting as members all Aryan (white gentile) citizens of the United States of America in good standing, fighting for Christian, gentile American nationalism under the traditional American constitutional system and hence fighting for outlawing all Jewish, atheistic, international Marxism and related phenomena." A circular setting forth its aims announces among other things that the swastika has already become the common sign of recognition of defenders of Aryan nationalism "against the Bolshevik scourge in Germany" and other countries. At a crowded meeting in Madison Square Garden in New York city on Feb. 20, 1939, in observance of Washington's birthday, speeches were made intended to arouse hostility against the Jews and to defend the Hitler program.

Kuhn, who was summoned to Washington in the winter to appear before the Dies Congressional committee investigating un-American activities, testified that the Bund had 71 branches with 20,000 members in 19 States of which 23 were in New York. A witness from the Department of Justice, however, testified later that after a thorough investigation it was impossible to find more than 6,614 members. Kuhn defended the anti-Jewish activities as necessary if an Aryan democracy was to be preserved in the United States. Other witnesses before the committee testified that the Bund received financial support from Germany and that in spite of its protestations of support of the American system of government it was actively engaged in propaganda in behalf of the totalitarian system of the Nazis.

The Bund supports several newspapers devoted to furthering its purposes by attacks upon the Jews and by elaborate defence of what Hitler has done and is doing. The Federal Bureau of Investigation reported after inquiry that the Bund planned to open camps near every military post and every navy yard to enable it to attract officers and men to its meetings and induce them to co-operate with it. Camps operating as clubs have been maintained by branches in some of the States.

The treaty between Hitler and Stalin, disclosed in late 1939, indicated that the hostility between the Nazis and the Communists was not so real as the Bund members had supposed and that the totalitarianism of the two was practically identical. This revelation was followed by a decline in membership and a modification in the form of propaganda circulated.

In early 1939 there were rumours that Kuhn had been using the funds of the Bund for his own purposes. Following an inquiry by the district attorney of New York county—the headquarters of the Bund are at 178 East 85th street, New York city—Kuhn was indicted for theft and falsifying the records. He was tried in the fall of 1939 and proof was submitted in support of the indictment. He was convicted on Nov. 29, 1939, and sentenced to from two-and-a-half to five years' imprisonment in Sing Sing. He is succeeded as head of the organization by G. Wilhelm Kunze, its publicity relations director.

(G. W. Do.)

Germany, a totalitarian State or dictatorship, known as the Third Reich, in Central Europe south of the North and Baltic seas and north of the Alps and Yugoslavia, bounded west by France, Belgium, and the Netherlands, and east (in 1939)

by Lithuania, U.S.S.R., and Hungary. From 1919 to 1939 East Prussia was separated from the main territory of Germany by the so-called Polish Corridor. Capital, Berlin; Reich Chancellor and Leader (*Fuehrer*), Adolf Hitler (*q.v.*).

Area and Population.—The area of the old Reich was 181,742 sq.mi.; population 66,029,000, census of June 16, 1933. The population was distributed among the 18 "Lands" (former States) and among the chief religious denominations in 1933 as follows:

Lands	Total pop.	Evangelical	Rom. Cath.	Jews†	Others
Prussia	39,692,167	25,387,595	12,571,007	361,826	1,613,583
Bavaria	7,681,584	2,203,499	5,370,719	41,939	65,427
Saxony	5,196,652	4,522,856	196,839	20,584	456,373
Württemberg	2,696,652	1,811,797	839,678	10,023	34,826
Baden	2,412,951	943,540	1,408,532	20,617	40,262
Hamburg	1,675,703	952,381	63,538	16,973	185,555
Thuringia	1,659,510	1,485,636	44,894	2,882	126,008
Hesse	1,429,048	933,473	439,048	17,888	38,639
Mecklenburg	804,948	764,794	31,831	1,003	7,585
Brunswick	512,989	454,250	21,004	1,174	35,661
Oldenburg	495,119	428,435	133,265	1,240	10,913
Bremen	371,588	317,188	24,122	1,438	28,810
Anhalt	364,475	320,708	13,008	909	29,798
Lippe	175,538	165,337	8,427	510	1,204
Schaumburg-L.	49,955	48,913	674	187	181
Saarland*	810,987	214,766	588,074	3,117	5,030
Germany	66,029,000	41,080,024	21,755,560	502,977	2,686,560

*Census of 1935. †Jews by religious faith; there are no census figures for Jews by blood; it was estimated that by the end of 1938 the Jews by faith had been reduced to less than 400,000.

There were (1933) 104 cities with a population of more than 50,000 each, and 567 cities and towns with more than 10,000 each. About 32.5% of the population lived in villages of less than 2,000; 10.6% in towns of between 2,000 and 5,000; and 7.3% in towns of between 5,000 and 10,000; almost half the population lived in communities of more than 10,000.

The population of the "Greater Reich," according to the census of May 17, 1939, was 79,592,000, or 86,400,000 if the "Protectorate" of Bohemia-Moravia is included. This Greater Reich was created by Hitler's annexation of the following territories: Jan. 13, 1935, Saarland, 864,000; March 13, 1938, Austria, 7,008,000; Oct. 1, 1938, Sudetenland, 2,945,000; March 15, 1939, Bohemia-Moravia, 6,805,000; March 22, 1939, Memel Territory, 153,000. In addition, by his war against Poland in Sept. 1939, Hitler added to the 86,000,000 of the Greater Reich the populations of Danzig, the Polish Corridor, Posen, and a strip of territory east of Silesia. The Poles, as far as possible, were exterminated or removed from these conquered districts and their places taken by Germans from the Reich or by tens of thousands of Germans "repatriated" from their old homes in Estonia, Latvia and Lithuania. Hitler also conquered more than half of the rest of Poland; its population of about 15,000,000 he probably hopes to organize into a puppet Polish state under German control.

History.—In Sept. 1938 Hitler declared personally to Mr. Chamberlain and publicly in a speech at Berlin that "he had no more territorial ambitions in Europe." Yet in less than a month, on Oct. 24, 1938, he secretly demanded from Poland the transfer to the Reich of Danzig (*q.v.*) and a strip of territory across the Polish Corridor to connect East Prussia with the rest of the Reich. The demand was renewed in Jan. 1939, but was neither accepted nor flatly rejected by Col. Beck, Poland's foreign minister, when he visited Hitler at Berchtesgaden to discuss the question.

On March 15, 1939, Hitler summoned Dr. Hacha, who had succeeded Dr. Benes as president of Czecho-Slovakia, to a midnight conference at Berlin. Dr. Hacha was compelled by threats of force to sign away the independence of his country and accept a German protectorate over Bohemia-Moravia. Slovakia was split off and formed into a republic, nominally independent but really under German control, because Germany acquired the right to garrison districts on the Slovakian border toward Poland and to march German troops through Slovakia. This annexation of 6,000,000 Czechs in Bohemia-Moravia, under the guise of a German protectorate, increased greatly Europe's fears of Hitler's



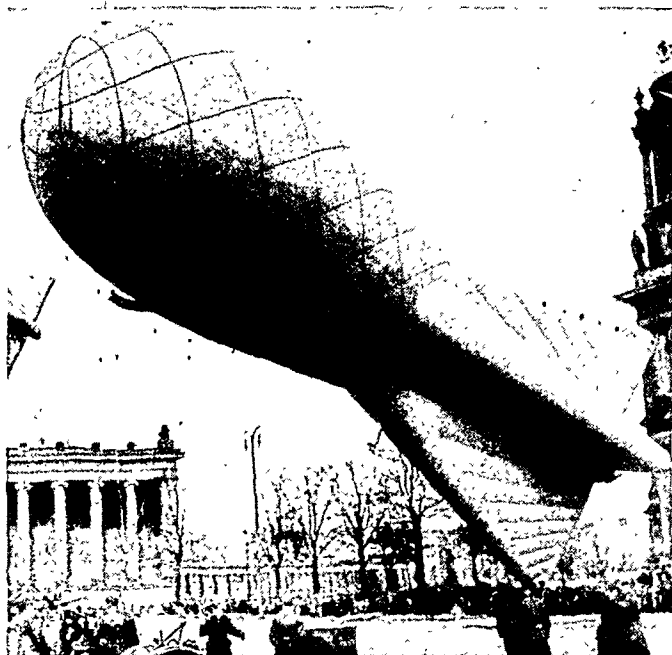
aggressive intentions in Eastern Europe, and showed the faithlessness of his promise after the Munich Agreement that he had no more territorial ambitions in Europe. Moreover, in annexing 6,000,000 Czechs, he was departing from his earlier statements that he was only seeking to bring into the Reich persons of German speech and culture. His pretext for annexing Bohemia-Moravia, as he declared in his Reichstag speech of April 28, was his fear that Czecho-Slovakia might become a landing place for Russian aeroplanes and thus become the spearhead by which Russian Communism would attack Western civilization.

Within a week of his annihilation of Czecho-Slovakia, Hitler demanded from Lithuania the former German territory of Memel, and annexed it on March 22, 1939. Encouraged by these successes, he renewed his demand on Poland for Danzig and a strip of territory across the Polish Corridor. The Poles, terrified by the fate which had overtaken Czecho-Slovakia and fearing that compliance would simply mean the first step in a dismemberment of Poland, at once rejected on March 26 Hitler's renewed demand. Three days later Prime Minister Chamberlain announced that Great Britain would support Poland if Poland found it necessary to fight to defend her independence and her territory. This British guarantee to Poland angered Hitler, who believed that it encouraged Poland to reject his demands and to take up a provocative attitude toward the Reich by alleged oppression of the German minorities in Poland. During the summer tension between Germany and Poland increased owing to recriminatory press attacks on both sides and owing to the increased danger of armed conflict in Danzig into which the Nazis were smuggling arms and German "tourists."

Great Britain repeatedly warned Hitler that she would live up to her promise to support Poland if Germany attacked Poland or tried to seize Danzig. Germany was warned not to make the same mistake as in 1914 of thinking that Great Britain would remain neutral in case of German aggression. But Hitler, advised by Ribbentrop, his minister of foreign affairs, appears to have thought that Great Britain could be bluffed out of supporting Poland. As a trump card in his game of bluff it was announced on August 22 that Ribbentrop was flying to Moscow to sign a German-Soviet pact of friendship. This, Hitler thought, would frighten the Poles into handing over Danzig and the Polish Corridor and would deter England from carrying out her promise to Poland. But this time Hitler grievously miscalculated. Poland and Great Britain stood firm. Therefore Hitler invaded Poland on September 1, and as a consequence found himself at war with Great Britain and France on September 3. (See EUROPEAN WAR.)

The invasion of Poland seems to have been made against the advice of Italy. It marked the weakening, or perhaps even the breaking, of the Berlin-Rome Axis. The German-Soviet pact also proved a bitter disillusionment to Hitler. It destroyed further any faith in his sincerity, because it was a complete reversal of his whole previous policy; for years he had been denouncing the Russian Communists as the worst enemies of mankind. He had repeatedly declared that it would be the greatest folly to trust them or make an alliance with them. The German-Soviet pact failed completely as the expected trump card in the game of diplomatic bluff against Poland and the Western democracies. Hitler appears to have been duped by Stalin. The Russian dictator took advantage of Hitler's war with Poland, France, and Great Britain to secure imperialist advantages for Russia: Stalin quickly invaded and annexed nearly half of Poland; he imposed treaties on Latvia, Estonia, and Lithuania giving Russia naval and aeroplane bases and military garrisons in these three little Baltic States, which were thus brought under Russian domination. Hitler had to withdraw Germans whose ancestors had been living in these countries for centuries. He thus had to abandon the old Pan-German ambition of adding them to the Reich. The Russian attack on Finland in November appeared to be a further effort to strengthen Russian power in the Baltic in case of a possible future war against Germany.

Education and Religion.—Education has gone through a drastic reorganization under Nazi rule. The period of school attendance was shortened by one year in 1937. Many new schools have been established for giving a year or two of professional or technical training; for many students this will replace the last years at the regular schools or at universities and the older technical institutes (*Hochschule*). Many schools have also been estab-



BERLIN'S BALLOON BARRAGE on a pre-war test of air-raid defences in 1939

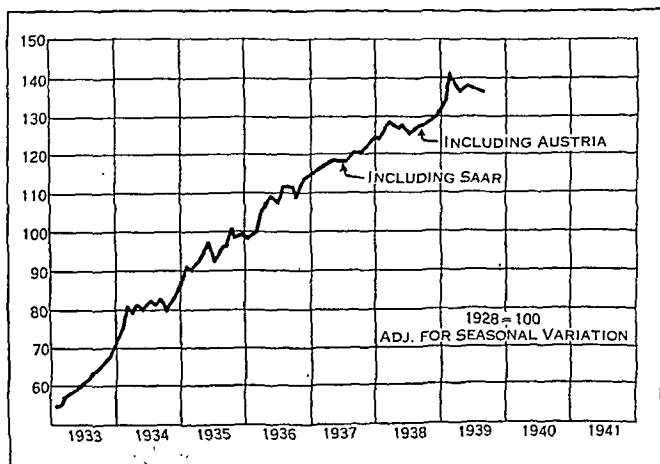
lished for training "leaders" for the Nazi Party and for Government positions; emphasis in them is placed on comradeship, sports, Nazi ideology and leadership.

Attendance at Germany's universities has been considerably cut down since the Nazi Revolution, partly owing to Government restrictions upon attendance, partly owing to the decline in the quality of teaching as a result of the dismissal or resignation of Jewish and liberal professors, and partly owing to other causes. The Government tends to shift students from the large city universities to the smaller town universities, especially those in Eastern Germany, where Nazi influence is stronger. Thus, the figures for attendance in the winter semester of 1929-30, and the limiting quotas fixed by Bernhard Rust, the Reich minister of education, for the winter semester of 1937-38, were for the larger universities respectively: Berlin, 16,149, 6,000; Cologne, 7,162, 2,400; Frankfurt, 5,242, 1,700; Hamburg, 3,995, 1,700; Munich, 9,028, 4,800.

By the end of 1939 there was a serious shortage of school teachers, skilled engineers and members of some other professional classes.

The Evangelical Protestants and the Roman Catholics, whose numbers and distribution are given in the table on p. 313, have suffered what they regard as severe persecution under the Nazi regime. The Protestant regional churches took steps in 1933 to form a single Reich Church in accord with Hitler's general policy of centralization. But aggressive Nazis, who ordinarily seldom attended church and who indulged in semi-pagan views, mobilized their efforts to secure the election of Ludwig Mueller as Reich bishop of the new church. This caused a split, which has grown deeper and deeper, between the official Evangelical Church and the really devout Christian Opposition pastors and their followers led by Dr. Martin Niemöller.

Pope Pius XI signed with Hitler in 1933 a Concordat guaranteeing to the Roman Catholics the free exercise of their religion, their religious schools, and their various religious youth, professional and charitable organizations. The guarantees have not been observed. There was much fear among Roman Catholics at the end of 1938 that, after the Jews had been mulcted by the 1,000,000,000-mark fine, the Nazis would soon make a great capital levy upon Roman Catholic property.



GERMANY: Industrial production index (*The Annalist*)

Finances and Banking.—No exact statement can be made in regard to the German Government's revenues and expenditures, as the budget has not been published since 1935. The taxes by the Central Government have nearly quadrupled since Hitler came to power, being about 6,000,000,000 marks for 1932-33, 11,500,000,000 for the fiscal year ending March 31, 1937, and estimated at roughly 22,000,000,000 for the year ending March 31, 1940. This does not include taxes of about 4,000,000,000 marks levied by the Lands and local communities (*Gemeinde*). The exact debt is also unknown, because the large amounts of Treasury bills issued to build armaments, auto highways and other public works, and to provide for the unemployed, are not counted in the debt until they fall due. Between 1935 and Jan. 1939, the Government publicly increased the Reich debt by issuing 13 long-term loans totalling over 15,000,000,000 marks, in order to take care of the Treasury bills as they fell due and to consolidate the short-term indebtedness. These loans all bore 4½% interest, were issued at 98½, and were quoted in Jan. 1939 at a fraction above the issue price. They do not include two 500,000,000-mark loans issued by the State railway (*Reichsbahn*) in 1936 and in 1939, nor loans by other Government enterprises. The total debt of the Reich in Jan. 1940 was conservatively estimated at more than 75,000,000,000 marks or \$30,000,000,000—approximately the same per capita debt as in the U.S. on the same date.

The Reichsbank's gold and foreign exchange reserves, which were about 4,000,000,000 marks in 1932, had shrunk to 70,000,000 at the end of 1939, and afforded only a 0.7% coverage for paper money, as compared with 24.7% in 1932 and with the 40% which before the World War (1914-18) was considered the lowest coverage compatible with safety. The standard of currency is the German mark, equivalent in U.S. money to 40.3325 cents. Owing to the Government's rigid control, its official exchange value is kept very close to its American and foreign equivalent.

Trade and Communication.—Since 1935 Germany's exports and imports have been very strictly controlled, first by Dr. Schacht's "new system," and then by Goering's dictatorial economic power as commissioner for the Four-Year Plan. Germany's imports and exports, and resulting balance of trade during the years 1932-39 were:

	Total Yearly			Monthly Average		
	Imports Million marks	Exports Million marks	Balance Million marks	Imports Million marks	Exports Million marks	Balance Million marks
1932 . . .	4,667	5,739	+ 1,072	389	478	+ 89
1933 . . .	4,204	4,871	+ 667	350	406	+ 56
1934 . . .	4,451	4,167	- 284	371	347	- 24
1935 . . .	4,159	4,270	+ 111	347	356	+ 9
1936 . . .	4,218	4,768	+ 550	332	397	+ 65
1937 . . .	5,468	5,011	+ 457	456	418	+ 38
1938* . . .	6,052	5,620	+ 432	504	468	+ 36
1939† . . .	2,755	2,814	+ 59	458	468	+ 10

*Figures do not include Austria and Sudeten area.
†Figures are for the first six months of 1939 only.

The above figures show that the imports tend to increase, especially in 1937 and 1938, while the exports increase less, with the result that the balance of trade becomes less favourable. Among the reasons for this is the fact that Germany has increased her imports of raw materials for her rapidly growing armaments, and to some extent her imports of food for her people and fodder for her cattle. The figures do not include the exports and imports of the annexed Austrian and Sudeten territories. If they did so, the deficit in the trade balance would have been greater in 1938, since Austria and the Sudeten territories have always had to import a larger proportion of their food than has Germany; as far as Germany's food problem goes, these two territories are a liability rather than an asset to Germany. This is partly indicated by the fact that the trade balance deficit in August, September,

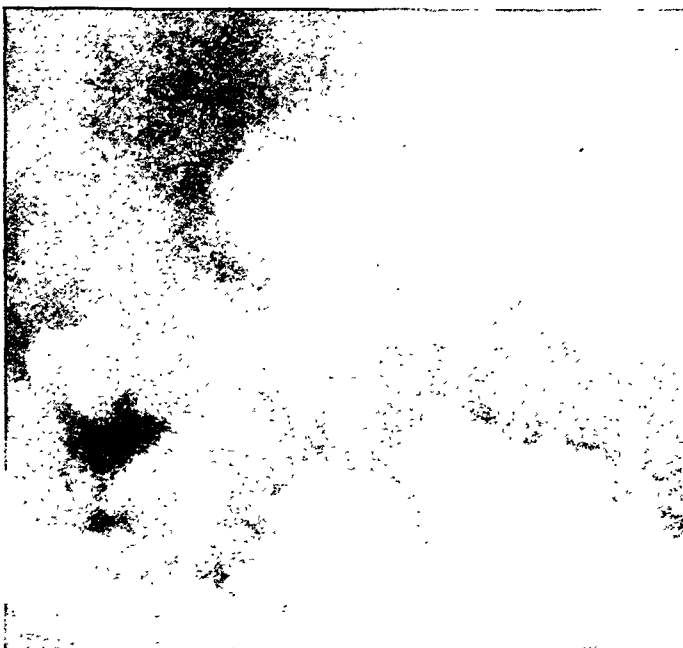


DISABLED PLANE photographed by Germans during their raid on the Firth of Forth Oct. 16, 1939; the Nazis claimed the plane was British

October, November in 1938 is shown by the following figures to be much greater for "Greater Germany," than those for the old Reich which are given in parentheses for each successive month: Greater Germany, -64 million marks (old Reich, -37 million marks); -50 (-34); -36 (-9); -69 (-33). The trade balance deficit was also much greater in the later months of the year than the monthly average for the whole year (-36). Here, then, is one of Germany's most serious problems for the future. If deficit in the trade balance continues to increase, as seems likely, it means that Germany is losing more and more of her foreign exchange, or more and more of her tiny gold supply, and will therefore be less able to buy food for her people and raw materials for her armaments and industries. And if she cannot get raw materials for her industries she will be less and less able to send out exports, which in turn will still further increase the deficit in the trade balance.

Another factor in the deficit in the trade balance, especially for the month of Nov. 1938, was probably the tightening of the foreign boycott against German goods as a result of the attacks upon

THE BRITISH CRUISER "EDINBURGH" photographed from a German plane above Rosyth naval base on the Firth of Forth after the ship was bombed during the raid of Oct. 16, 1939





ADOLF HITLER reviewing battered members of the Nazi corps in Prague after proclaiming the German protectorate over Bohemia Mar. 16, 1939

Jewish synagogues and stores and the arrest of thousands of Jews which began on November 10. This was alleged by Dr. Goebbels to be the result of "the justified and understandable anger of the German people over the cowardly Jewish murder of a German diplomat in Paris," but was in fact organized by some of the more radical Nazi authorities. The murder of Ernst vom Rath, a secretary in the German embassy at Paris, by the young Polish Jew, Grynspan, was speedily but illogically made the excuse for levying a gigantic fine of 1,000,000,000 marks upon the Jews of Germany. In this way the Nazis hoped to offset some of the deficit in their foreign trade balance and to acquire eventually some very much needed foreign exchange. But with the outbreak of war in Sept. 1939 the British blockade cut off more than 40% of Germany's overseas trade. The exact figures are not available because with the outbreak of war Germany ceased the monthly publication of her trade statistics.

The German State railway (*Reichsbahn*) included in 1935, 53,330km. (33,076mi.) of standard gauge lines and 879km. (546mi.) of narrow gauge lines. Privately owned lines were 3,732km. (2,313mi.) of standard and 752km. (476mi.) of narrow gauge. Owing to Hitler's great efforts for the rapid completion of a line of fortifications on the western frontier against France during the summer of 1938, on which 500,000 men were employed and on which vast quantities of cement and steel were employed, the railways were somewhat neglected. There were many complaints toward the end of 1939 that trains were late and were unable to handle freight promptly.

In 1939 the disruption of train schedules led during the latter part of the year to a series of disastrous wrecks.

German inland shipping in 1937 included 5,375 vessels moving under their own power and totalling 528,000 tons; and 12,488 canal boats and other vessels without power, totalling 5,835,000 tons. High-seas shipping included 3,579 vessels with a total registered net tonnage of 2,238,000. In 1938, as a result of the year-long trial of Arnold Bernstein for alleged evasion of German foreign exchange laws, his two lines, the Bernstein and Red Star Lines, passed under German control.

By the end of 1938 Germany had completed the construction of 3,000km. (1,864mi.) of the new automobile highway network (*Reichsautobahn*). This completes about half of the highways

projected. They are magnificent concrete two-way roads, separated by a grass strip, and without any crossings; intersecting roads use bridges or underpasses. The highways have regard for scenic beauty, and are of great economic and strategic importance. They have cost nearly 3,000,000,000 marks (nearly \$1,200,000,000), and have given employment to 250,000 workers, half directly and half indirectly.

Agriculture, Manufactures, Mineral Production.—Germany's grain harvests were medium or poor in 1936 and 1937, causing some food and fodder shortage. This was partly offset by the 1937 potato crop, which reached an all-time high record, and by the grain harvest of 1938 which was exceptionally good. Latest available figures for principal crops in thousands of metric tons are:

	Rye	Wheat	Barley	Oats	Potatoes	Sugar-Beets	Fodder Beets
1932 . . .	8,363	5,003	3,214	6,650	47,016	7,875	34,486
1933 . . .	8,727	5,604	3,468	6,052	44,071	8,578	30,776
1934 . . .	7,607	4,532	3,203	5,452	46,780	10,394	33,804
1935 . . .	7,478	4,667	3,387	5,385	41,015	10,567	34,711
1936 . . .	7,386	4,426	3,399	5,618	46,323	12,095	37,826
1937 . . .	6,020	4,580	3,640	5,020	53,600	15,701	40,538
1938 . . .	8,463	5,502	4,177	6,274	48,700	17,200	41,700
1939* . . .	—	—	—	—	54,540	17,400	39,500

*Figures for 1939 are estimated. The total grain harvest was estimated at 27,430,000 metric tons, i.e., 6.4% more than the total for 1938.

Owing to Germany's lack of gold and foreign exchange with which to buy raw materials, Hitler established in 1936 the Four-Year Plan. Its purpose is to develop Germany's own resources and furnish substitutes for goods and raw materials formerly imported. The "Hermann Goering Reich Stock Company for Ore Mining and Iron Smelting" for the mining of low grade iron ore in the Salzgitter district in Central Germany near Hanover was expected to produce 1,000,000 tons of crude steel by 1940 when the plant is completed. Synthetic gasoline, rubber, soap, textiles partly of wood products, and other substitute (*Ersatz*) products are already being successfully developed, but at a high cost; they demand much labour and invested capital furnished in part by the State, and threaten the ultimate exhaustion of Germany's forest and mineral resources. They have caused such a shortage of labour that it is estimated that 60% of Germany's industrial workers now have to work 12 (and in some cases 14) instead of 8 hours a day. Germany's principal mineral and manufactured products were as follows in metric tons:

	1933	1934	1935	1936	1937
Coal . . .	109,532,600	125,405,600	143,491,300	159,756,600	184,500,000
Lignite . .	126,756,600	137,223,400	147,162,100	161,426,900	184,700,000
Iron Ore . .	2,592,000	4,343,000	6,044,000	7,570,000	9,792,000
Lead . . .	91,000	98,400	122,300	139,000	158,500
Zinc . . .	162,000	212,800	205,000	207,700	194,300
Rock salt . .	1,841,300	2,024,200	2,077,200	2,383,800	2,767,000
Potash . . .	7,362,800	9,616,700	11,672,500	11,764,600	14,460,000
Pig iron . .	5,246,500	8,716,700	12,846,200	15,302,500	15,960,000
Steel . . .	7,393,200	11,601,700	16,013,500	18,590,900	19,387,000

(See also ANTI-SEMITISM; ARMIES OF THE WORLD; BALKAN ENTENTE; BOHEMIA AND MORAVIA; BRAZIL; COMMUNISM; CZECHO-SLOVAKIA; EDUCATION: *General World Trends*; EUROPEAN WAR; FASCISM; MINORITIES; PROPAGANDA; RELIGION; ROMAN CATHOLIC CHURCH; RUTHENIA; SLOVAKIA; UNITED STATES: *Roosevelt and the Dictators*; YOUTH MOVEMENTS.)

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Ghazi Ibn Feisal (1912–1939), King of Iraq, was born on March 21, at Mecca and succeeded to the throne as Ghazi I on Sept. 9, 1933, following the death of Feisal I, his father, in Switzerland. He was educated at Harrow and the Royal Iraqi Military college. His reign was marked by periodic internal disorders and by his promotion of large-scale projects to modernize the kingdom. A revolt in 1935 was suppressed by the youthful ruler, but in October of the following year a sudden coup d'état, preceded by the assassination of the minister of defence, placed Gen. Baqir Sidqi in political control. Sidqi was himself assassinated in Aug. 1937, and the unrest continued. Ghazi's treaty of alliance with King Ibn Saud of Saudi Arabia was a notable step toward Pan-Arab unity in the Near East but did not prevent the king from maintaining cordial relationships with France and Great Britain. Ghazi was married on Sept. 19, 1933 to his cousin Aaliah, the daughter of the late King Ali of the Hejaz. His son, born May 2, 1935, became King Feisal II under a regency when Ghazi died April 4 after a motor car accident near the royal palace in Baghdad. A rumour that Ghazi had been murdered by British citizens caused the assassination of the British consul in Mosul the same day.

Gibbons, Floyd (Phillips) (1887–1939), American journalist and war correspondent, was born at Washington, D.C., on July 16 and was educated at Gonzaga college and Georgetown university. His first reportorial assignment was with *The Minneapolis Daily News* in 1907. Later he worked for *The Milwaukee Free Press* and *The Minneapolis Tribune*. In 1912 he joined the staff of *The Chicago Tribune*, where he received considerable attention for his reporting of the Villa revolution in Mexico. He was aboard the British liner "Laconia" when it was torpedoed off the coast of Ireland Feb. 25, 1917, and reported the disaster in a lengthy dispatch. After America's entry into the World War, he was appointed war correspondent for the *Tribune* on the western front; during the battle of Château-Thierry he was seriously wounded and lost the sight of one eye. After the war he was "roving" correspondent in Russia. He also covered the Japanese conquest of Manchuria and the Italo-Ethiopian war of 1935–36. Gibbons was preparing to leave for France as a war correspondent when he died September 24 in his home at Saylorsburg, Pennsylvania. Among his published works are *The Red Knight of Germany* (1927) and *The Red Napoleon* (1929).

Gibraltar: see BRITISH POSSESSIONS IN THE MEDITERRANEAN.



GERMAN VETERANS of the Spanish civil war marched in review past Air Marshal Hermann Goering upon their arrival in Hamburg May 31, 1939

Gilbert, Prentiss Bailey (1883–1939), U.S. diplomat, was born in Rochester, N.Y., on October 3 and was educated at the University of Rochester and at Yale, Columbia, and the Colejo de San Carlos at Cebu in the Philippines. He was a special aide in the Philippines during the Spanish-American war and was promoted from first lieutenant to major, General Staff, during the World War. In 1919 he was appointed chief of the U.S. Division of Political and Economic Intelligence. He became chief of the division of Western European affairs in the Department of State in 1924. He was first secretary of the American embassy in Paris in 1930, U.S. consul at Geneva from 1930 to 1937, and counsellor to the embassy in Berlin from 1937 until his death. After the recall of Ambassador Hugh R. Wilson on Nov. 14, 1938, Gilbert was the ranking American diplomat in Germany. He died in Berlin February 24.

Gilbert and Ellice Islands Colony: see PACIFIC ISLANDS, BRITISH.

Gilman, Lawrence (1878–1939), U.S. critic and author, was born at Flushing, N.Y., on July 5. See *Encyclopædia Britannica*, vol. 10, p. 356, for his biography and a list of his principal works. Since 1923 he had been music critic of *The New York Herald-Tribune*, and from 1933 to 1936 he was radio commentator for the Sunday broadcasts of the New York Philharmonic-Symphony concerts. He died at Sugar Hill, N.H., on September 9.

Gin: see LIQUORS, ALCOHOLIC.

Ginger: see SPICES.

Girl Scouts, a voluntary leisure-time organization in the United States for girls from seven to eighteen years old. Its program offers activities in the fields of homemaking, nature, out-of-doors, community life, international friendship, dramatics and literature, arts and crafts, music and dancing, health and safety, sports and games. It is adapted to girls of various ages: the Brownie program is for girls from seven to ten

years old; the Girl Scout program for girls from ten to 14 years old; and the Senior Girl Scout program for girls from 14 to 18 years old. At the end of 1939 there were approximately 564,000 Girl Scouts in the United States. Girl Scouts, Inc. (the official title of the organization) is a member of the World Association of Girl Guides and Girl Scouts which has headquarters in London, England. Thirty-one countries are members of the World Association. The world membership is about 1,500,000.

Lord Baden-Powell, founder of the Scout movement for boys and girls, founded the Girl Guides in England in 1909. The membership of the Girl Guides of Great Britain was 525,276 at the end of 1937. In 1912 Juliette Low (Mrs. William Low) took the idea of the movement to the United States, where it was called Girl Scouting.

In 1939 the Girl Scout organization adopted a revised constitution providing for biennial elections of officers and other changes. A two-year work plan was adopted with the objective of providing more opportunity for Girl Scouts to develop techniques of democratic living and to participate in community activities commensurate with their ages and of bringing parents into closer contact with the organization. In August, five Girl Scouts from the United States attended a meeting of Girl Guides and Girl Scouts from nine nations at "Our Chalet," international Girl Scout meeting place near Adelboden, Switzerland. (C. M. R.)

Glands and Hormones: see ENDOCRINOLOGY; MEDICINE; PHYSIOLOGY.

Glass. In Europe, political disturbances caused indefinite postponement of the Third International Congress on Glass, scheduled for July 1939 in Berlin and Munich. The outbreak of war interrupted research and curtailed glass-manufacturing operations.

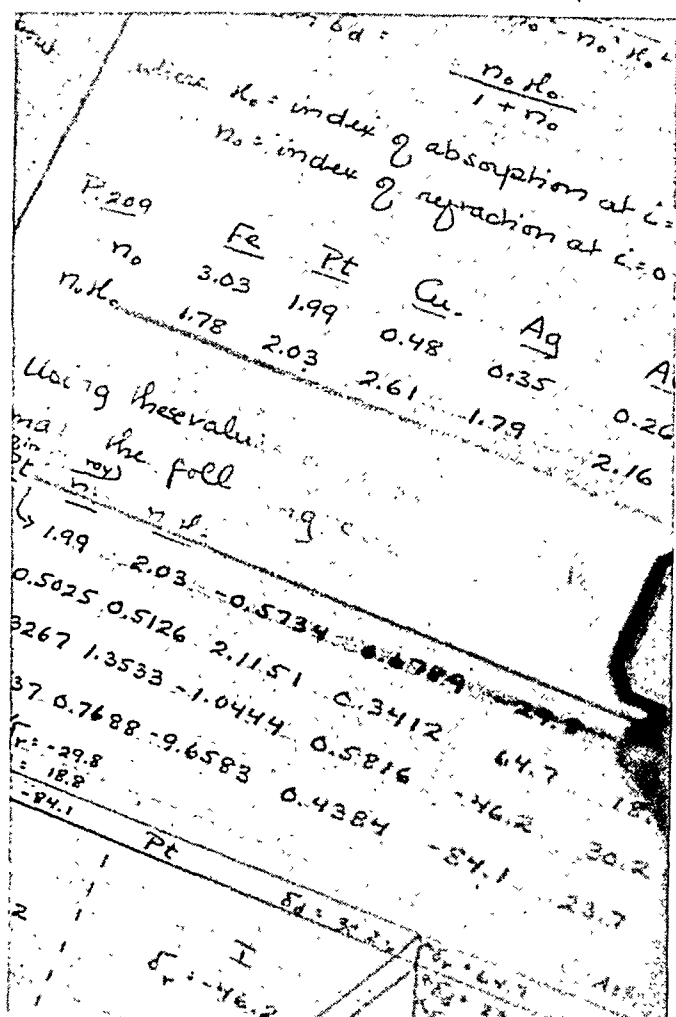
In the United States, the glass industry was fairly prosperous, although output did not nearly utilize capacity of plants. Plate-glass production reached 140,000,000 sq.ft., but was retarded by strikes in the automotive industry, where most plate glass is used. Window glass, in a year of low construction, totalled 500,000,000 sq.ft.; and the output of bottles and containers, 50,000,000 gross, was second only to 1937. More than 280 United States patents relating to glass manufacture were issued. The legality of extensive patent monopolies became an issue in the Government suit against corporations who thus allegedly control automatic glassware production.

The outstanding announcement of 1939 in glass technology was that of the perfection of "re-constructed" or "pre-shrunk" high-silica glass at the Corning Glass Works, as the result of years of research by Hood, Nordberg and others. The process requires several steps: a workable glass is formed into ware; heat treatment separates the glass into two phases, one of which is then completely dissolved out in an acid bath; the remaining, porous body, consisting almost entirely of silica, is reinvigorated by heating to bright redness, and is thereby shrunk without deformation to about two-thirds its original volume, becoming a clear glass of very low expansibility.

Glassware made by this process can be heated red-hot and plunged into ice-water without injury. This new glass is much cheaper than fused silica or "quartz glass" but it possesses nearly the same physical and chemical properties.

Another Corning development is a glass centrifugal pump for handling hot acids or other corrosive liquids.

Safety glass has been improved by the use of vinyl resins to form a plastic middle layer of superior strength, flexibility and permanence under extreme changes of temperature. (See also FELDSPAR; SELENIUM.) (S. R. S.)



INVISIBLE GLASS (left section in strip) was perfected in Jan. 1939 in the laboratories of General Electric Company. The right third of the glass is untreated; the middle is only partially coated with non-reflecting film

G-Men: see FEDERAL BUREAU OF INVESTIGATION.

Gold. Reacting to the continued open market and increased price, gold production established another new record output in 1938, for the seventh consecutive year. Production is so widely scattered, and figures from many of the smaller and more remote producers are so slow in arriving that even yet it is impossible to arrive at an accurate figure for the 1938 total; since the latest production tabulation to arrive lists no less than 79 producing countries, this condition is not surprising. The situation is still further complicated by the fact that no statistics are published for the Soviet Union, the second largest producer, so that only estimates for the world total can be presented. As a result, it is becoming customary for statistical agencies to report the total of other production, omitting the Russian output entirely. On this basis, using the latest data available, the world gold output in 1938, excepting the Soviet Union, was 32,140,000 oz., an increase of 9% over 1937. The various published estimates on the Russian output for 1937 vary from 5,000,000 oz. up to 5,800,000 ounces. This would indicate a world total somewhere near 37,400,000 ounces. The production rate continued to expand in 1939 and the total, excepting the Soviet Union, for the first 8 months of the year was 22,300,000 oz., an increase of 7.3% over the same period of 1938, with another new record for the year's total.

South Africa continued to hold pre-eminence, with a total of 12,161,000 oz. in 1938, and an estimated increase of 5% to 12,800,-

000 oz. in 1938. The lowering of the average grade of ore treated, which dropped from 0.2253 oz. per ton in Jan. 1938 to 0.2051 oz. in Jan. 1939, did not continue in 1939, but rose to 0.2073 oz. in September.

The Soviet Union has definitely taken second place, but the actual magnitude of the output is a matter of pure conjecture, with opinions varying within wide limits. However, there now seems to be pretty general agreement that the Russian output has been declining since 1935.

The United States held third place with a 1937 total of 5,148,000 oz. (including the Philippines), or 4,245,000 oz. for the United States alone. Production for 1939, including the Philippines, was 5,600,000 oz., an increase of 8% over 1938 and 4,600,000 oz. for continental United States.

Canada in 1938 stood fourth, with an output of 4,725,000 oz. and an increase of 15% over 1937. There was a smaller advance in production rate in 1939, the total for the year being estimated at 5,046,000 oz., an increase of 7%. This placed Canada in an intermediate position, fourth in rank, after the United States including the Philippines, but third, ahead of the United States, as compared with it alone.

The only other individual producer having an output in excess of 1,000,000 oz. was Australia, with 1,593,000 oz. in 1938. The Japanese Empire had an estimated output of about 1,768,000 oz. in 1938, from Japan proper, Chosen (Korea), and Taiwan (Formosa), an increase of 19% over 1937.

The British Empire in 1937 produced from 29 separate units, a total of 21,240,000 oz. of gold, 57% of the world total. The three leading countries, South Africa, Canada, and Australia, all with outputs exceeding 1,000,000 oz., contributed 57%, 22% and 7.5% respectively.

Intermediate producers, with outputs in excess of 100,000 oz. were: Southern Rhodesia 4%, Gold Coast 3%, India 2%, and New Guinea and New Zealand 1% each; 2% is divided among the various minor producers.

The price of gold in London rose steadily from 150s.0½d. on Jan. 2, 1939, to 160s. on September 1. With the outbreak of war with Germany, the price was fixed at 168s. on September 5, and this was maintained to the end of the year, with dealings in gold prohibited except through official channels, and the requirement that all coin or bullion be sold to the Government. (See also FEDERAL RESERVE SYSTEM; GOLD RESERVES AND GOLD STANDARD; MINERAL AND METAL PRICES AND PRODUCTION.) (G. A. Ro.)

Gold Coast: see BRITISH WEST AFRICA.

Golden Gate International Exposition: see ARCHITECTURE; ART EXHIBITIONS; ART GALLERIES AND ART MUSEUMS; CALIFORNIA; ELECTRIC LIGHTING; FAIRS AND EXHIBITIONS; INTERIOR DECORATION; LUMBER; SAN FRANCISCO.

Gold Reserves and Gold Standard. The coming of war in Europe in 1939 compelled much of the world to make over its economy from a peacetime to a wartime basis. In this transition, which affected the belligerents most noticeably but did not permit the neutral nations to escape, the status of gold was likewise modified. In peace the main reliance of the world as a backing for currency, a curb on credit inflation and a means of settling international balances, gold became in war a mighty sinew of national defence.

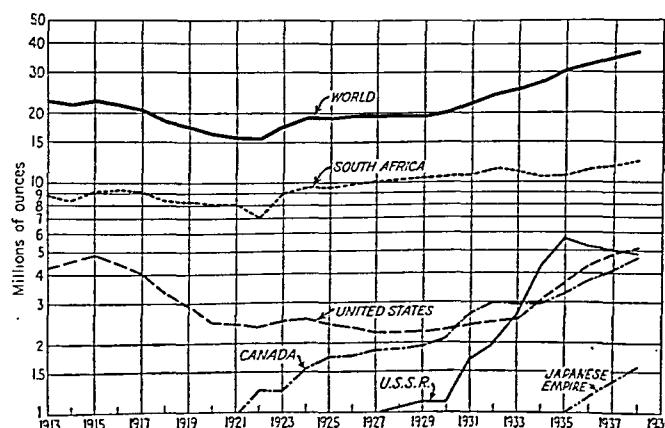
Up to the outbreak of war the record of gold in world affairs in 1939 was very largely a repetition of its performance in 1938. Gold moved westward across the Atlantic in a swollen flood as private capital fled from those nations which might lie in the path of war. Included also in this gold in flight were substantial portions of the official gold reserves of several countries in

Europe, which sought, on the one hand, to place their gold beyond reach of sudden seizure and, on the other, to build up a reserve of purchasing power in the United States, which was in the World War (1914-18) a granary and machine-shop for Europe, and might be again.

Once the war had descended upon Europe, however, England, the point of origin of the bulk of the gold shipments to the United States, and its ally, France, invoked regulations promptly to deprive capital of its freedom of movement. They adopted exchange restrictions even more severe than those found necessary in the war of 1914-18 and without precedent in recent years except in the totalitarian countries. They frankly stripped gold of its remaining attributes as a currency reserve and made of it a material of war. For them gold was no longer an instrument for minimizing currency fluctuations. It became for them the solidest asset in their war chest, to be drawn on only to pay for goods required in winning the war and preserving their national existence. It was noted in 1938 that gold was coming to be regarded in Europe "as a prime requisite of national defence." So it proved at once after the German tanks, planes, and troops crossed the Polish border in the early morning hours of September 1 and the evil day which Europe had so long dreaded was at hand.

There were two major movements of gold in 1939 prior to the onset of war. The first of these came in March 1939, following the completion by Germany of the task, begun in the preceding September, of dismembering Czecho-Slovakia. Four major movements of gold took place in the 18 months before Germany set upon Poland. The first was in March 1938, when Germany stripped Austria of its independence. The second came in Sept. 1938, in the anxious weeks which preceded the Munich settlement. The third got under way in March 1939, after Germany tore Czecho-Slovakia asunder, taking half for itself and tolerating in the other half the establishment of a State subservient to the Reich.

The outpouring of gold from Europe to the United States in the spring of 1939, though, was somewhat different from the two major movements which preceded it in 1938. For in the spring of 1939 several of the neutral European nations, observing how Germany swooped down upon Czecho-Slovakia and seized its gold as well as its lands, began to move a substantial part of their gold reserves to the United States for safekeeping. They hoped thus to put their reserves of the metal beyond the grasp of a neighbour whose thirst for gold was second only to his hunger for territory. Switzerland, Sweden, Norway, Belgium, and Holland—small States all, whose defences might be overwhelmed by a sudden attack—moved great quantities of their official holdings of gold to the United States and placed it under earmark at the Federal Reserve Bank



GOLD PRODUCTION: world total and output of the principal producing countries (*The Mineral Industry*)

A RECORD SHIPMENT of gold, \$60,000,000 in bullion, arrived in New York city Mar. 31, 1939

of New York. The amount of gold under earmark for foreign account in the United States increased by \$114,800,000 in April, \$251,600,000 in May, \$102,600,000 in June and \$166,200,000 in July, reaching at the end of the last-named month the highest total on record at \$1,287,000,000.

Thus Governments competed with their nationals for space for gold in steamships departing from Europe for New York. Where the net additions to the earmarked gold stock in the United States in Aug., Sept. and Oct. 1938, amounted to \$152,300,000, in the four months ended July 1939, such net additions totalled \$635,200,000. Gold imported into the United States in Sept. and Oct. 1938, at the time of the Munich crisis, was valued at \$1,083,000,000, most of it arriving from Europe. The spring crisis of 1939 brought \$1,400,600,000 of gold to the United States, and in the two months preceding, and the first month subsequent to, the German invasion of Poland the net gold imports amounted to \$1,105,000,000. Included in the 1939 import figures was \$165,122,000 of Belgian gold, \$301,311,000 of Netherlands gold, and \$78,946,000 of Swiss gold.

The statistics on capital movements compiled by the United States Treasury showed that \$1,086,100,000 net of foreign capital was received in the United States from Dec. 28, 1938, to Aug. 30, 1939, of which \$657,400,000 came from Europe. European Governments viewed with tolerance, if not actually with approval, this massing of the capital of their nationals in the United States. Subsequent events made it clear that European Governments were preparing to appropriate the liquid dollar resources of their nationals, if war should come. The cash-and-carry provision of the United States neutrality act closed the door to belligerent credits and placed a premium thereby on gold and cash resources in the United States, if resort was to be had in wartime to the materials and machines which the United States could supply.

When war came, there was for gold a sudden break with the past. The United Kingdom, the British Empire countries, and

France imposed strict foreign exchange regulations and forbade the export of gold except by licence. On Sept. 6, 1939, the Bank of England transferred \$1,162,000,000 of gold—its entire holding, except for a nominal amount—to the Exchange Equalization Account. Official prices were fixed for sterling, as for the French franc. In fact, not a country remained at the close of 1939, save perhaps the United States, of which it could be said with confidence that its gold would be used without stint to support its currency. The estate of gold had not been lower in modern times, for even in the World War the belligerents used gold to keep their exchanges steady.

The acknowledged gold reserves of the 52 leading nations, according to Federal Reserve Board calculations, declined from \$25,468,000,000 in Dec. 1938 to \$25,277,000,000 at the close of Oct. 1939. Omitted from the latter total, however, were the gold holdings of the European stabilization funds. Gold resources of the British Exchange Equalization Account were reckoned at \$2,000,000,000, while the French stabilization fund owned \$477,000,000 of gold in May 1939, in addition to the \$2,714,000,000 of gold in the Bank of France. Gold production continued to expand and in the first nine months of 1939 amounted to \$893,000,000, exclusive of the Soviet Russian output, a record high. The monthly average output in this period was \$99,170,000, against \$94,170,000 in 1938. In 1929, before the round of currency depreciations and gold revaluations, gold production was valued at \$383,000,000.

The table below sets forth the changes in value of the lead-

Currency	1929	1933	1938	Oct., 1939
Argentine peso	95.127	72.801	32.507	29.770
Belga	13.912	17.900	16.804	16.720
Milreis	11.8072	7.9630	5.8438	6.0575
Canadian dollar	99.247	91.959	99.419	89.331
French franc	3.9161	5.0313	2.8781	2.2736
Lira	5.2334	6.7094	5.2605	5.0465
Yen	46.100	25.646	28.451	23.510
Guilder	40.162	51.721	55.009	53.115
Swedish krona	26.784	22.032	25.197	23.792
Swiss franc	19.279	24.836	22.871	22.433
Pound sterling	485.69	423.68	488.94	401.05

ing currencies in recent years vis-a-vis the United States dollar.

The Scandinavian nations and Japan dissociated their currencies from the sterling group after the outbreak of war and affixed the pegs for their units to the United States dollar. (See also AGRICULTURE; EXCHANGE RATES; FINANCIAL REVIEW; GOLD.)

(E. H. Co.)

Gold Standard: see GOLD RESERVES AND GOLD STANDARD.

Golf. There was little abatement of golf interest in the United States in 1939. Tournaments were well patronized, club membership rosters throughout the country maintained the general high level of the previous year and daily fee courses generally reported increased revenue and activity.

There was an apparent moratorium on controversial rules questions. The United States Golf Association failed, despite contrary predictions, to abolish the varied collection of heavy-soled niblicks. Nor was an attempt made to limit the weight of these clubs. The stymie rule as amended and adopted in January seemed to wear well with tournament players.

The golfer of the year was Marvin (Bud) Ward of Seattle, Wash., who won the Amateur title and came within a stroke of tying for Open title. In the Open championship, played over the Philadelphia Country Club course, Ward was one of a half-dozen contestants with an excellent chance of winning as the final round started.

On the par 3 eleventh and thirteenth holes Ward scored "fives." Despite tossing away four strokes to par on these holes he finished one stroke behind Byron Nelson, Craig Wood and Denny Shute, who tied at 284 and were obliged to play off for the title Ralph Guldahl had relinquished after winning two successive years.

In the first 18-hole replay Wood and Nelson played sensationally, once again tying. Their scores of 68 necessitated another play-off. This time Nelson became champion, getting off to a brilliant start with a birdie on the third hole and an eagle on the fourth where he holed out a shot with a driving iron.

The disappointment of the championship was Sam Snead who had set a record in 1938 by winning \$20,000 in purses. Snead, the public favourite, faltered on the final hole of the 72-hole test and shattered his hopes with an 8 on the par 5 hole.

The Amateur championship was one of recurring surprises. Tom Sheehan of Michigan established a record in winning the qualifying medal with 138 at North Shore. He was defeated in the first match play round by an obscure player.

Ward, who was obliged to sink a 25-ft. putt on the nineteenth green of his first round match with Eddie Held to keep from being eliminated, won on the next green and then went on to defeat Raymond Billows, 1937 runner up, 7 and 5 in the final. Ward's putting was phenomenal. In the 66 holes required for him to defeat Arthur Doering of Chicago in the semi-final and Billows in the final, the Pacific Northwest player used a single putt on 27 greens.

The United States women's championship opened with a flourish of foreign invaders but terminated with two youthful Americans in the final. Pamela Barton, who had regained the British championship earlier in the year, was favoured to win the American title at Wee Burn. She was defeated in an extra hole quarter-finals match by Charlotte Glutting, member of the last three Curtis Cup teams. Miss Glutting herself was beaten in the following round, losing on the nineteenth green to Dorothy Kirby after being two up with three to play. Miss Kirby lost in the final to Betty Jameson of San Antonio, Tex. Fay Crocker, South American champion from Montevideo, shared favouritism with Miss Barton. She was defeated in an extra hole match by 18-year old Elizabeth Hicks of California, the "find" of the tournament.

Patty Berg of Minneapolis was unable to defend her championship. The youthful Minnesotan was stricken with appendicitis less

than a fortnight before the championship.

The stormiest session to occur at a tournament all year was precipitated by Denny Shute in the Professional Golfers Association championship at Pomonok, Flushing, L.I. Shute, exempt from sectional qualifying for the championship because of his Ryder Cup team status, neglected to forward his annual subscription on time to the association secretary. This was held by the P.G.A. executive committee to be sufficient grounds for disqualification.

George Jacobus, P.G.A. president, over-ruled his executive committee and ordered the tournament to be continued with Shute as a competitor. The tournament was concluded after the qualifying round had been interrupted for almost two hours. Scoring over the comparatively short course was consistently below par. Henry Picard and Byron Nelson survived the par shattering and engaged in a thrilling 36-hole final match. Nelson scored 67 both morning and afternoon but could not gain an inch. On the 37th hole Picard sank a 7-ft. putt for a birdie and won the title when Nelson missed a 5-ft. putt. It was Picard's first triumph in a major championship. Apart from winning the P.G.A. title Picard was the largest money winner during 1939, although his total was slightly more than one-half of Snead's \$20,000 in 1938. Ralph Guldahl and Dick Metz were close behind.

The Professional Golfers Association nominated a team to compete for the Ryder Cup although it already had been notified by the British P.G.A. that the war situation in Europe made it impossible to send over a team to compete in the biennial matches which were to be held at Ponte Vedra, Florida. The team personnel were Picard, Nelson, Guldahl, Metz, Snead, Harold McSpaden, Horton Smith, Paul Runyan, Victor Ghezzi and Jimmy Hines. Ben Hogan, Shute, E. J. Harrison and Wood, all of whom had higher standings in the Harry Vardon Memorial trophy ratings, were ignored by the P.G.A.

Most of the championships had been decided in Europe before war beclouded the continent. Although he failed to win the British title, Henry Cotton, who had been appointed captain of the Ryder Cup team, became a magnet for galleries as he toured British courses playing exhibition matches to raise Red Cross funds. Ironically, Cotton won the 1939 German Open Championship. Miss Barton hastened home from the United States women's championship to don a uniform and drive an ambulance. The British Open turned up a surprise winner in Richard Burton, but not until after three hours of anxious waiting.

John Bulla, a little known American professional, who made a brief splurge in the U.S. championship at Philadelphia, finished the 72-hole test with a score of 272. The weather on the final day was inclement at historic St. Andrews and one by one the British players came in with higher scores than Bulla who was playing in the tournament for the first time. One of the last to finish, Burton posted a courageous 71 to snatch the title from the giant American.

James Bruen, 19-year old Irish amateur, was the cynosure of all eyes after he scored two 69s in the qualifying round. Bruen failed to hold the pace and finished in a tie with Cotton at 298, eight strokes behind the victor. Bruen also proved a disappointing surprise in the British and Irish Amateur and the Irish Open championships. He reached the semi-final of the British Amateur. That title was won by Andrew Kyle. The Irish Open was won by Arthur Lees and in the Irish Amateur Bruen was defeated 3 and 1 by Gerry Owens. Bill Holt of Syracuse, N.Y. and Richard Chapman of Greenwich, Conn., proved the chief American threats in the British Amateur. Chapman was vanquished in the quarter-final and Holt in the semi-final. Chapman later won the French Amateur championship.

Jimmy Adams, who engaged in Red Cross exhibition matches with Cotton, won the Scotch Open and Hamilton McNally ac-

quired the Scotch Amateur title. Jessie Anderson, British champion in 1937 and a member of the 1938 Curtis Cup team, won the Scottish ladies' championship. (T. Hv.)

Goncourt Prize Novel: see LITERARY PRIZES: *France*.

Gonorrhoea: see VENEREAL DISEASES.

Goodnow, Frank Johnson (1859-1939), U.S. educator, was born in Brooklyn on January 18. He was educated at Amherst and Columbia, and later studied in Paris and Berlin. From 1883 to 1907 he taught history and administrative law at Columbia. He was legal adviser to the Chinese Gov't in 1913 and 1914, and president of Johns Hopkins university from 1914 to 1929. Dr. Goodnow, who was author of many volumes on legal and political subjects, died at Baltimore. November 14.

Gordon, Sir Charles Blair (1867-1939), Canadian banker and industrialist, was born at Montreal on November 22 and was educated at the high school there. After a brief period in private employment he organized his own firm which later became, through a series of mergers, the Canadian Converters company. He was president of the Bank of Montreal from 1927 until his death and was a director of numerous textile, glass, mining, banking, and public utilities companies, also of the Canadian Pacific railway. He died at Montreal July 30.

Gort, John Standish Surtees Prendergast

Vereker, 6TH VISCOUNT (1886-), British soldier, was born in July 1886, son of the 5th viscount, whom he succeeded in 1902. He was educated at Harrow and Sandhurst, and joined the Grenadier Guards as second lieutenant in 1905. In 1913 he was appointed aide-de-camp to the general officer commanding the London district, and at the start of the World War (1914-18) he was in the first contingent that went to France. He served throughout the war, sometimes on the staff and then on regimental duty; he was wounded four times, mentioned in dispatches nine times, and received the Victoria cross, the Military cross, and the Distinguished Service Order with two bars. He was an instructor in the army staff college from 1921 to 1923 and in 1926 became chief instructor at the senior officers' school. In Jan. 1927 he was appointed general staff officer of the Shanghai defence force and later held a similar appointment in the 4th division of the army. In 1930 he was appointed commander of the Grenadier Guards, and from 1932 until early in 1936 he was in India as director of military training. He had been promoted to major-general in Nov. 1935, and in Sept. 1937 he was appointed military secretary to the secretary of War, with the local rank of lieutenant-general. On Dec. 2, 1937 he received his appointment as chief of the British Imperial general staff, and in 1939 he led the British expeditionary forces again to French soil, after his appointment September 3 as commander-in-chief of the British field forces, with the Duke of Gloucester as his chief liaison officer.

Government Departments and Bureaus.

The following are the leading officers of the more important Government departments and bureaus of the United States. The date for the information is Jan. 15, 1940.

Department or Bureau	Name	Post
Department of State	Hull, Cordell	Secretary
	Welles, Sumner	Under-Sec'y
Department of the Treasury	Morgenthau, Henry, Jr.	Secretary
	Bell, Daniel W.	Under-Sec'y
Comptroller of the Currency	Delano, Preston	Comptroller
Treasurer of the U. S.	Julian, William A.	Treasurer

Department or Bureau	Name	Post
Bureau of Customs	Harris, Basil	Commissioner
Bureau of Internal Revenue	Helvering, Guy T.	Commissioner
Federal Alcohol Administration	Alexander, W. S.	Administrator
*The Coast Guard	Waesche, Russell R.	Commandant
Department of War	Woodring, Harry H.	Secretary
	Johnson, Louis A.	Asst. Sec.
Chief of Staff	Marshall, George C.	Chief of Staff
Adjutant General	Adams, Emory S.	Adj. General
Chief of Engineers	Schley, Julian L.	Chief
Chief of the Air Corps	Arnold, Henry H.	Chief
Department of Justice	Jackson, Robert H.	Att'y-Gen.
Solicitor General	Biddle, Francis J.	Solic. Gen.
*Federal Bureau of Investigation	Hoover, J. Edgar	Director
Bureau of Prisons	Bennett, James V.	Director
*Post Office Department	Farley, James A.	Post. Gen.
Department of the Navy	Edison, Charles	Secretary
Office of Naval Operations	Stark, H. R.	Chief
Bureau of Navigation	Nimitz, C. W.	Chief
General Board	Sexton, W. R.	Chairman
*Marine Corps	Holcomb, Thomas	Commandant
Department of the Interior	Ickes, Harold L.	Secretary
	Wirtz, Alvin J.	Under-Sec'y
General Land Office	Johnson, Fred W.	Commissioner
Office of Indian Affairs	Collier, John	Commissioner
Geological Survey	Mendenhall, W. C.	Director
*Bureau of Biological Survey	Gabrielson, Ira N.	Chief
Bureau of Reclamation	Page, John C.	Commissioner
Bureau of Fisheries	Jackson, Charles E.	Acting Commissioner
National Park Service	Cammerer, Arno B.	Director
Bureau of Mines	Finch, John W. (resigned)	Director
Department of Agriculture	Wallace, Henry A.	Secretary
	Wilson, M. L.	Under-Sec'y
Agricultural Adjustment Administration	Evans, R. M.	Administrator
*Bureau of Agricultural Chemistry and Engineering	Knight, Henry G.	Chief
Bureau of Agricultural Economics	Tolley, Howard R.	Chief
Bureau of Animal Industry	Mohler, John R.	Chief
Commodity Credit Corporation	Robbins, Carl B.	President
Bureau of Entomology	Strong, Lee A.	Chief
Farm Credit Administration	Black, Albert G.	Acting Gov.
Food and Drug Administration	Campbell, Walter G.	Chief
Forest Service	Granger, C. M.	Acting Chief
Bureau of Home Economics	Stanley, Louise	Chief
Bureau of Plant Industry	Auchter, E. C.	Chief
Rural Electrification Administration	Slattery, Harry	Administrator
Soil Conservation Service	Bennett, Hugh H.	Chief
Weather Bureau	Reichelderfer, F. W.	Chief
Department of Commerce	Hopkins, Harry L.	Secretary
	Noble, E. J.	Under-Sec'y
Bureau of the Census	Austin, William L.	Director
Bureau of Foreign and Domestic Commerce	Young, J. W.	Director
*National Bureau of Standards	Briggs, Lyman J.	Director
Coast and Geodetic Survey	Colbert, Leo O.	Director
Bureau of Marine Inspection and Navigation	Field, R. S.	Director
Patent Office	Coe, Conway P.	Commissioner
Department of Labor	Perkins, Frances	Secretary
	McLaughlin, C. V.	Asst. Sec'y
United States Conciliation Service	Steelman, J. R.	Director
Bureau of Labor Statistics	Lubin, Isador	Commissioner
Immigration and Naturalization Service	Houghteling, James L.	Commissioner
Children's Bureau	Lenroot, Katharine F.	Chief
Women's Bureau	Anderson, Mary	Director
Wage and Hour Division	Jacobs, Harold D.	Acting Administrator
Independent Offices		
*Civil Service Commission	Mitchell, Harry B.	President
Interstate Commerce Commission	Eastman, Joseph B.	Chairman
*Federal Reserve System Board	Eccles, Marriner S.	Chairman
Federal Trade Commission	Davis, E. L.	Chairman
United States Tariff Commission	Stevens, Raymond B.	Chairman
United States Board of Tax Appeals	Arundell, C. R.	Chairman
Federal Power Commission	Olds, Leland	Chairman
*Veterans' Administration	Hines, Frank T.	Administrator
*Smithsonian Institution	Abbot, C. G.	Secretary
*Pan American Union	Rowe, L. S.	Director Gen.
*American National Red Cross	Davis, Norman H.	Chairman
*Tennessee Valley Authority	Morgan, Harcourt A.	Chairman
Federal Deposit Insurance Corporation	Crowley, Leo T.	Chairman
Securities and Exchange Commission	Frank, Jerome N.	Chairman
The National Archives	Connor, R. D. W.	Archivist
National Labor Relations Board	Madden, J. Warren	Chairman
Federal Communications Commission	Fly, James L.	Chairman
*Government Printing Office	Giegengack, A. E.	Public Printer
Civil Aeronautics Authority	Hinckley, Robert H.	Chairman
Air Safety Board	Hardin, Thomas	Chairman
United States Maritime Commission	Land, Emory S.	Chairman
Maritime Labor Board	Bruere, Robert W.	Chairman

Department or Bureau	Name	Post
Federal Security Agency	McNutt, Paul V.	Administrator
Civilian Conservation Corps	McEntee, J. J.	Acting Director
National Youth Administration	Williams, Aubrey	Administrator
Office of Education	Studebaker, John W.	Commissioner
*Public Health Service	Parran, Thomas, Jr.	Surgeon Gen.
Social Security Board	Altmeier, Arthur J.	Chairman
Federal Works Agency	Carmody, John M.	Administrator
Public Buildings Administration	Reynolds, W. E.	Commissioner
Public Roads Administration	MacDonald, Thomas H.	Commissioner
Public Works Administration	Clark, E. W.	Acting Commissioner
U. S. Housing Authority	Straus, Nathan	Administrator
*Works Projects Administration	Harrington, F. C.	Commissioner
Federal Loan Agency	Jones, Jesse H.	Administrator
*Export-Import Bank of Washington	Moore, R. Walton	Chairman
*Federal Home Loan Bank Board	Fahey, John H.	Chairman
Home Owners' Loan Corporation	Jones, Charles A.	Gen. Manager
Federal Housing Administration	McDonald, Stewart	Administrator
*Reconstruction Finance Corporation	Schram, Emil	Chairman
Executive Office of the President		
Bureau of the Budget	Smith, Harold D.	Director
Central Statistical Board	Rice, Stuart A.	Chairman
National Resources Planning Board	Delano, Frederic A.	Chairman
Office of Government Reports	Mellet, Lowell	Director

*See separate article.

Great Britain.—The following were the ministers, permanent under-secretaries, etc., of the more important of the Government departments of Great Britain at the close of 1939:

Department or Bureau	Name	Post
Admiralty, The Board of	Winston Churchill	First Lord
Agriculture and Fisheries	Sir R. H. Archibald Carter	Permanent Secretary
Air Ministry	Sir Reginald Dorman-Smith	Minister
Burma Office: see India Office.	Sir Donald Fergusson	Permanent Secretary
Cabinet Office	Sir Kingsley Wood	Secretary of State
Civil Service Commission	Sir Arthur Street	Perm't Under-sec'y
Colonial Office	Sir Edward Bridges	Secretary
Commissioners of Crown Lands	A. P. Waterfield	1st Commissioner
Committee of Imperial Defence	Malcolm MacDonald	Secretary of State
Crown Agents for the Colonies	Sir Cosmo Parkinson	Perm't Under-sec'y
Customs and Excise, Board of	The Minister of Agriculture and Fisheries (<i>ex-officio</i>)	Commissioner
Dominions Office	C. L. Stocks	Perm't Commissioner
Duchy of Lancaster and Ministry of Food	The Prime Minister	Chairman
Economic Warfare, Ministry of	Admiral of the Fleet	Deputy Chairman and Minister for Co-ordination of Defence
Education, Board of	Lord Chatfield	Secretary
Foreign Office	Sir Edward Bridges	Minister
Health, Ministry of	Sir W. Cecil Bottomley	Director-General
Home Office and Ministry of Home Security	H. C. Thornton	President
India Office	J. E. W. Flood	Permanent Secretary
Information, Ministry of	Sir G. Evelyn P. Murray	Chief Diplomatic Adviser
Inland Revenue, Board of	Anthony Eden	Perm't Under-sec'y
Labour and National Service, Ministry of	Sir Cosmo Parkinson	Minister
	W. S. Morrison	Perm't Under-sec'y
	Sir John Bennett	Minister
	Sir Henry L. French	Secretary
	R. H. Cross	Minister
	Sir Frederick Leith-Ross	Director-General
	Earl De La Warr	President
	Sir Maurice Holmes	Permanent Secretary
	Viscount Halifax	Secretary of State
	Sir Robert Vansittart	Chief Diplomatic Adviser
	Sir Alexander Cadogan	Perm't Under-sec'y
	Sir Walter E. Elliot	Minister
	Sir George Chrystal	Secretary
	Sir John Anderson	Secretary of State
	Sir A. Maxwell	Perm't Under-sec'y
	Sir T. Gardiner	Home Office
	Sir G. Gater	Joint Secretaries
	Marquess of Zetland	Ministry of Home Security
	Sir Findlater Stewart	Secretary of State
	Lord Macmillan*	Perm't Under-sec'y
	Sir Kenneth Lee	Minister
	A. P. Waterfield	Director-General
	Sir Gerald B. Canny	Deputy Director-General
	Ernest Brown	Chairman
	Sir T. W. Phillips	Minister
		Secretary

Department or Bureau	Name	Post
Patent Office	M. F. Lindley	Comptroller-general
Paymaster General's Office	Earl Winterton	Paymaster-general
Pensions, Ministry of	Sir Walter Womersley	Minister
Post Office	Sir Adair Hore	Permanent Secretary
Privy Council Office	Maj. G. C. Tryon	Postmaster-general
Public Record Office	Sir Thomas Gardiner	Director-general
Public Trustee Office	Earl Stanhope	Lord President
Scottish Office	Sir Rupert B. Howorth	Clerk of the Council
Shipping, Ministry of	The Master of the Rolls	Keeper of the Records
Stationery Office, H.M. Supply, Ministry of	C. T. Flower	Deputy Keeper
Trade, Board of	Sir Ernest Fass	Public Trustee
Transport, Ministry of	John Colville	Secretary of State
Treasury	Sir Horace P. Hamilton	Under-sec'y of State
	Sir John Gilmour	Minister
	Sir Cyril Hurcomb	Director-General
	Sir William R. Codling	Controller
	Leslie Burgin	Minister
	Sir Arthur Robinson	Secretary
	Oliver Stanley *	President
	Sir William Brown	Permanent Secretary
	Capt. Euan Wallace	Minister
	Sir Leonard Browett	Permanent Secretary
	Neville Chamberlain	Prime Minister and First Lord
	Sir John Simon	Chancellor of the Exchequer
	Sir Horace Wilson	Permanent Secretary and Head of H.M. Civil Service
War Office	Leslie Hore-Belisha*	Secretary of State
Works and Public Buildings	Sir James Grigg	Perm't Under-sec'y
	Herwald Ramsbotham	First Commissioner
	Sir Patrick Duff	Secretary

*In Jan. 1940 Oliver Stanley replaced Mr. Hore-Belisha at the War Office, Sir John Reith replaced Lord Macmillan at the Ministry of Information, and Sir Andrew Duncan replaced Mr. Stanley at the Board of Trade.

Government Expenditures. The rôle of expenditures for military purposes has become increasingly important and may be expected to rise even more rapidly in the near future as the major war (or wars) in Europe becomes more destructive and widespread. The late conflicts in Manchuria, Spain, Ethiopia and China and those in Europe in 1939 required huge outlays both by the aggressor and the defending nations. Also, as a result of repeated threats to peace throughout the world, an accelerated armament race was begun, and the democratic countries as well as the totalitarian states were making military expenditures, which in many instances were setting (1939) new peace-time records. Until existing conflicts are halted and more enduring peace relations established, there can be no expectation of reduced outlays for armaments.

United States.—Total expenditures of the Federal Government of the United States for the fiscal year ending June 30, 1940 are expected to reach a new post-World War high of \$9,099,000,000. This aggregate is \$392,000,000 or 5%, above the total for the previous fiscal year. According to the Budget Summary submitted by the President of the United States to the Congress on Jan. 4, 1940, the total of regular and emergency expenditures for the national defence of \$1,457,000,000 in 1939-40 is \$401,000,000 higher than in 1938-39. Thus the increase in national defence expenditures closely parallels the rise in total disbursements, indicating little change in the aggregate of all other Federal outlays in 1939-40 as compared with the preceding year. Increases in the 1939-40 expenditures are shown for nearly all items except unemployment relief and the drop in this one item alone from \$2,677,000,000 in 1938-39 to \$1,912,000,000 in 1939-40 was of sufficient magnitude to offset the increases elsewhere. Particularly marked were the gains of \$155,000,000 in the Agricultural Adjustment program, \$171,000,000 on public works expenditures, \$110,000,000 in the interest on the public debt, and \$151,000,000 in the expenditures of the regular departments of the Government. The drop in work relief coincided with a substantial improvement in the general business situation which began at the close of the 1938-39 fiscal year and which was given added impetus by the outbreak of hostilities between the major European powers in Sept. 1939.

GOVERNMENT EXPENDITURES

Table I.—Actual and Estimated Receipts and Expenditures of the United States Government for the Fiscal Years 1931–41
(In Millions of Dollars)

	Total 1931-1941	Estimated		Actual								
		1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931
Ordinary expenditures:												
Legislative, judicial, and civil establishments:												
Legislative establishment	220	23	22	21	21	21	22	18	16	16	19	21
Judicial establishment†	30	11	10	9								
Department of Agriculture	1,179	125	159	151	132	146	116	69	61	64	92	64
Department of Commerce	266	34	36	19	17	20	25	19	14	19	27	36
Department of the Interior	594	65	71	80	63	54	46	50	33	42	47	43
Department of Justice	470	39	38	32	40	37	37	33	31	42	48	43
Department of Labor	170	21	20	16	15	14	13	18	12	14	15	12
Post Office Department (deficiency)	901	57	38	40	47	39	86	64	64	117	203	146
Department of State	182	19	21	17	17	17	17	16	11	15	17	15
Treasury Department	1,497	163	160	151	148	151	142	120	97	112	136	117
War Department (nonmilitary)	554	58	62	49	52	54	47	50	44	43	47	48
District of Columbia (United States share)	71	6	6	5	5	5	6	5	6	8	10	9
Independent offices and commissions	1,493	274	228	180	144	114	104	100	69	92	95	93
Supplemental items	100	50	50									
Total, legislative, judicial, and civil	7,677	945	921	770	701	672	661	562	458	584	756	647
National defence												
Veterans' pensions and benefits	9,763	1,534	1,297	1,056	980	895	880	663	494	633	664	667
Interest on the public debt	9,617	500	541	545	572	1,128	2,348	604	554	849	973	943
Refunds of receipts	9,109	1,100	1,050	940	926	866	749	821	757	689	599	612
Agricultural Adjustment Program	821	71	69	68	100	56	54	77	64	70	101	91
Social security	5,004	862	937	782	362	527	533	712	289			
Railroad retirement	1,706	437	378	347	302	200	42					
Government employees' retirement funds	534	141	132	110	145	6						
Other (Commodity Credit losses, etc.)	521	93	87	75	73	47	41	21	21	21	21	21
Supplemental items	286		120	5	98	1	1	3	14	5	49	6
Total, national defence, etc.	100	50	50									
Total, ordinary expenditures	37,461	4,848	4,661	3,918	3,558	3,726	4,648	2,895	2,193	2,267	2,407	2,340
Total, ordinary expenditures	45,138	5,793	5,582	4,688	4,259	4,398	5,309	3,457	2,651	2,851	3,163	2,987
Extraordinary expenditures:												
Emergency national defence	460	300	160									
Public works:												
Public highways	2,585	192	209	205	237	351	244	317	268	178	210	174
Tennessee Valley Authority	302	40	41	41	42	42	49	36	11			
Reclamation	535	59	99	79	65	52	50	41	25	25	26	14
Rivers and harbours, improvement	953	50	66	75	98	148	150	133	76	51	55	51
Flood control	621	121	109	80	61	45	36	31	41	34	28	35
Public buildings	799	59	71	51	77	76	68	58	79	106	86	68
Grants to public bodies	1,585	113	328	379	190	273	234	49	19			
Other	1,381	155	259	201	110	115	83	101	106	78	94	79
Total	8,761	789	1,182	1,111	880	1,102	914	766	625	472	499	421
Unemployment relief:												
Direct relief	4,158	50	95	104	154	184	588	1,016	716	351		
Work relief (W. P. A., etc.)†	10,491	1,089	1,532	2,283	1,516	1,937	1,208	11	805			
Civilian Conservation Corps	2,775	225	285	290	326	386	486	436	332	9		
Total	17,424	1,364	1,912	2,677	1,996	2,527	2,372	2,363	1,853	360		
Loans, subscriptions to stock, etc. (net)‡	3,620	178	263	231	104	150	71	424	882	181	873	263
Total extraordinary expenditures	30,265	2,631	3,517	4,019	2,980	3,779	3,357	3,553	3,360	1,013	1,372	684
Total expenditures, exclusive of debt retirement	75,403	8,424	9,099	8,707	7,239	8,177	8,666	7,010	6,011	3,864	4,535	3,671
Excess of expenditures	30,332	2,876	3,933	3,542	1,384	3,148	4,550	3,210	2,895	1,784	2,529	481
Less: Return of surplus funds from Government corporations	700	700										
Net deficit	29,632	2,176	3,933	3,542	1,384	3,148	4,550	3,210	2,895	1,784	2,529	481
Increase in gross public debt	28,753	1,716	2,783	3,274	1,400	2,647	5,077	1,648	4,514	3,052	2,686	616
Gross public debt at the end of each fiscal year		44,938	43,222	40,439	37,165	36,425	33,778	28,701	27,053	22,539	19,487	16,801

*Excess of credits, deduct.

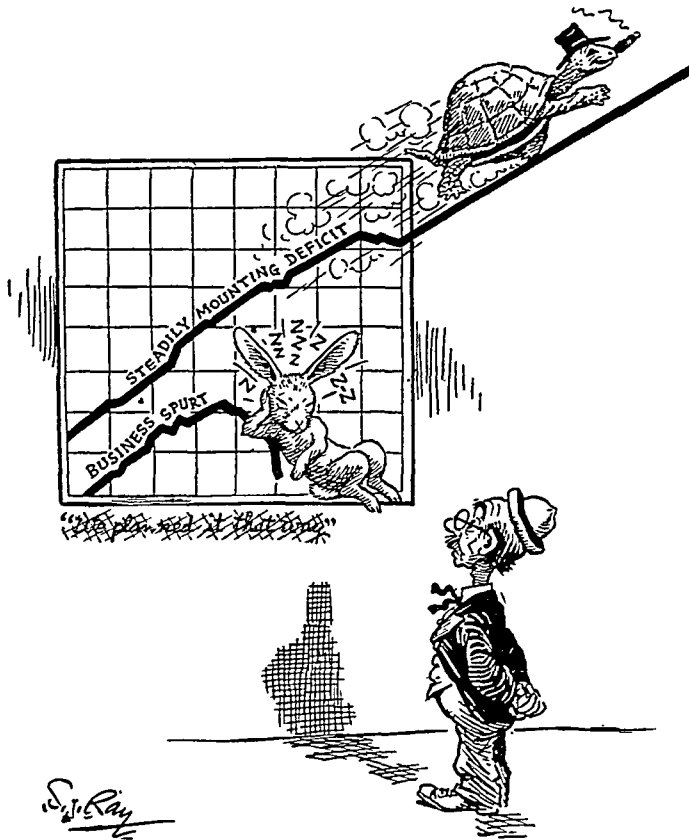
†Expenditures for the fiscal years 1931 to 1938 included in Department of Justice.

‡Includes expenditures in 1941 from supplemental item of \$1,125,000,000 for relief.

Government receipts for the fiscal year 1940 are estimated at \$5,166,000,000, which is practically identical with the total for the 1939 fiscal year. The net deficit was \$3,542,000,000 in the year ending June 30, 1939 and the estimated deficit for the year ending June 30, 1940 is \$3,933,000,000. This will be the largest deficit for any year since the World War, with the single exception of 1936 when the soldiers' bonus was paid and the deficit totalled \$4,550,000,000. In his Budget Message of Jan. 4, 1940, the President submitted his budget recommendation for the fiscal year 1940-41. Despite a further increase of \$377,000,000 in national defence expenditures, the proposed budget calls for a decline in expenditures of \$675,000,000, or 7%, from the 1939-40 peacetime record's total. For all items other than the national defence, the estimated decline exceeds \$1,000,000,000, or one-seventh. Reductions are proposed for most activities with the largest curtailment being the \$548,000,000 drop in unemployment relief. Moderate increases are scheduled in social security disbursements and for the interest on the public debt. Revenues of the Federal Government are expected to be nearly \$400,000,000 higher in 1940-41 than in the preceding fiscal year. This rise in re-

ceipts and the drop in expenditures, coupled with an expected return of surplus funds from Government corporations, are expected to effect a drop in the net deficit from \$3,933,000,000 in 1939-40 to \$2,176,000,000 in the year ending June 30, 1941. The President further recommended new taxes to the Congress for the specific purpose of financing the emergency national defence expenditures. These taxes, which if adopted are expected to yield \$460,000,000, would further reduce the net deficit in 1940-41 to \$1,716,000,000, the smallest in the past decade with the exception of the fiscal year 1937-38.

There has been increased discussion and consideration in recent years in the United States with reference to the treatment in the budget of expenditures for assets of a long enduring nature. In the Federal budget all expenditures, whether for current items or durable assets, are included in determining the deficit or surplus for the year. This differs from the treatment of capital outlays in accounting statements of private business enterprises. A corporation deducts only depreciation on capital assets each year rather than deducting the total cost of the asset in the year when constructed or purchased. In recent years the Federal Govern-



THE TORTOISE AND THE HARE of 1938 and 1939, as pictured by Ray of *The Kansas City Star*

ment has expended billions of dollars for the construction of roads, school buildings, airports, dams, post offices, administrative buildings and other assets which will be useful for many years. Had these outlays not been charged as current expenditures, the deficit would have been reduced considerably and in some years surpluses would have been shown. The President has suggested to the Congress the desirability of capitalizing at least those capital expenditures of the Government which have proved to be self-liquidating. There are many persons who would go further and change the entire budget procedure to accord with the practices of private business enterprise.

Expenditures of State and local Governments in the past five years have been approximately the same as Federal outlays. It is important to take cognizance of the disbursements of all agencies of Government to get a complete picture of Government expenditures. All Government outlays are met by taxes or borrowing and the large magnitude of State and local taxes in the United States makes the public clearly conscious of these units. In 1928 and 1929 State and local Government expenditures were nearly three

times as large as the Federal Government disbursements. Their approximately identical level now reflects a sharp increase in new activities of the Federal Government as well as some shift in functions from the lesser governmental agencies.

Great Britain.—Table II presents a breakdown of the annual expenditures of Great Britain for the fiscal years 1929–1930 to 1938–39, inclusive, and a pre-war estimate of 1939–40 expenditures. Over this entire period, the fluctuation in expenditures has been considerably less than in the United States. The peak of expenditures for this period was estimated at £1,026,000,000 in 1939–40 which is about the same as in 1938–39 and compares with £920,000,000 in the fiscal year 1937–38. This increase is largely accounted for by expanding military outlays. Total estimated expenditures for army, navy, and air service were £256,000,000 in 1938–39 and estimated at £223,000,000 in 1939–40 as compared with £197,000,000 in 1937–38. The expenditure figures for the fiscal year 1939–40 shown in the accompanying table and cited above, represent the budget estimates which were submitted in the early months of 1939, some time before the outbreak of hostilities between Great Britain and Germany. The budget indicated a small decline in defence expenditures in 1939–40, but footnotes in the budget revealed provisions had been made for very substantial defence outlays which could be authorized by a supplementary budget.

Revised estimates of revenues and expenditures for the year 1939–40 were submitted to the House of Commons on Sept. 27, 1939, less than four weeks after the war began. It was pointed out that even prior to the outbreak of the war, there had been substantial increases in defence provisions over those called for in the original budget. On Sept. 1, 1939, there had been a Vote of Credit of £500,000,000 which alone was equal to more than half the total of all expenditure anticipated in the original budget. The revised budget revealed a probable decline in revenues of the Government as a result of the war. The impossibility of predicting the effect of the war upon expenditure was emphasized. It appeared that total outlays for the year might be put at nearly £2,000,000,000, more than double the pre-war expectations. It was stated that the increase would have to be met by borrowing. (See also NATIONAL DEBTS; NATIONAL INCOME.) (R. R. N.)

Government Printing Office. The office was established by authority of Congress in 1860 to execute printing and binding for the executive and judicial departments and the court of claims. Its functions now extend to all branches of the Government and include the sale of official publications, reports and technical bulletins. Many of its publications are printed in foreign languages and find circulation in other countries. When the present construction is completed the total area occupied by the Government Printing Office will be over 1,374,281 sq.ft. of floor space. The value of the

Table II.—Financial Statement, Great Britain 1929–30 to 1939–40
(Millions of Pounds)

	1929–30	1930–31	1931–32	1932–33	1933–34	1934–35	1935–36	1936–37	1937–38	1938–39	1939–40†
Interest and Management of National Debt	307	293	290	282	216	212	212	211	216	230	230
Payments to Northern Ireland Exchequer	6	6	6	7	7	7	7	8	9	16	17
Other Consolidated Fund Services	3	3	3	4	4	6	7	4	3	—	—
Total Consolidated Fund Services	316	302	299	293	227	225	226	223	228	246	247
Army Votes (including Ordnance Factories)	40	40	38	36	37	40	45	55	63	87	84
Navy Votes	56	53	51	50	53	56	65	81	78	95	70
Air Votes	17	18	18	17	17	17	27	50	56	74	68
Civil Votes	260	307	320	343	339	346	362	368	394	427	435
Customs and Excise and Inland Revenue Votes	12	12	12	12	12	13	13	13	14	15	15
Total Supply Services	385	430	439	458	458	472	512	507	605	698	697
Total Ordinary Expenditures	701	732	738	751	685	697	738	790	833	944	942
Sinking Fund	47	67	32	26	8	12	12	13	11	—	—
Post Office Vote	59	59	58	59	59	62	66	72	76*	81*	83*
Road Fund	22	23	23	23	26	26	26	27	—	—	—
Total Self-Balancing Expenditures	81	82	81	82	85	88	92	99	76	81	84
Total Expenditure	829	881	851	859	778	797	842	902	920	1,025	1,026
Total Revenue	815	858	851	827	809	805	845	897	949	995	1,006
Balance	-14	-23	—	-32	31	8	3	-5	29	-30	-20

*Includes Broadcasting.

†These were pre-war estimates. See text for comments.

plant, including buildings and equipment will then be well over \$16,765,000. During the fiscal year 1939 there were 5,500 employees on the rolls of the Government Printing Office with a payroll of approximately \$11,500,000. The Office produced a total of 128,676,071 publications of all classes. This total includes 5,302,269 copies of the *Congressional Record*; 5,330,421 copies of specifications of patents, trade marks, designs, etc.; and 233,038 copies of the *Official Patent Office Gazette* and annual indexes. Postal cards printed amounted to 2,136,042,180; money orders shipped, 261,804,697; and the Stores Division handled approximately 90,000,000lb. of paper. During the year 1939 the Division of Public Documents mailed out 944,076,072 publications and forms; its receipts from the sale of Government publications during the year amounted to \$928,459.88. The total value of all printing done was \$18,238,045.10. (A. E. Gr.)

Governors and Premiers, British: see BRITISH EMPIRE.

Gozo: see BRITISH POSSESSIONS IN THE MEDITERRANEAN.

"Graf Spee": see GREAT BRITAIN; HISPANIC AMERICA AND THE EUROPEAN WAR; LANGSDORFF, HANS; MUNITIONS OF WAR; NEUTRALITY; SUBMARINE WARFARE; URUGUAY; EUROPEAN WAR.

Grain: see BARLEY; CEREALS; CORN; OATS; RICE; RYE; WHEAT.

Grand Coulee Dam: see DAMS; ELECTRIC TRANSMISSION AND DISTRIBUTION; WASHINGTON.

Granger, Alfred Hoyt (1867–1939), U.S. architect, was born May 31 at Zanesville, Ohio, and was educated at Kenyon college, Massachusetts Institute of Technology and the Ecole des Beaux Arts, Paris. After practising in Cleveland he formed a partnership in Chicago; in 1898. Among the buildings designed by him are the La Salle street and Chicago & North Western terminals in Chicago, the Union station in Omaha, two buildings for Indiana university and the Medical and Dental buildings of the University of Illinois. He died December 3 at Roxbury, Conn.

Granite: see MARBLE AND GRANITE.

Grapefruit. The United States, the world's leading producer of grapefruit, had a crop of 36,600,000 boxes in 1939, the Department of Agriculture estimated November 1. This compares with 43,794,000 boxes in 1938 and a ten-year average (1928–37) of 18,923,000 boxes. These figures illustrate the important part of grapefruit in the citrus fruit development which has expanded more than any other agricultural commodity in the last 20 years. All the United States production is in four States and was as follows in 1939 and 1938:

	1939 boxes	1938 boxes		1939 boxes	1938 boxes
Florida . . .	17,100,000	23,600,000	Arizona . . .	2,500,000	2,700,000
Texas . . .	15,200,000	15,670,000	California . . .	1,800,000	1,824,000

The Florida crop was made up of 6,900,000 boxes of seedless and 10,200,000 boxes of other varieties. Texas grapefruit was shipped to Europe for the first time in 1939. Exports of grapefruit from the United States for the crop years ending Aug. 1939 and 1938 were to the following countries:

	1939 boxes	1938 boxes		1939 boxes	1938 boxes
Canada . . .	835,000	685,400	Philippine Islands . . .	5,300	4,900
United Kingdom . . .	243,700	213,600	New Zealand . . .	4,000	6,100
France . . .	27,100	32,500	British Malaya . . .	3,500	4,000
Norway . . .	18,000	3,500	Australia . . .	3,400	3,700
Germany . . .	18,000	1,400	Hongkong . . .	3,400	2,300
Netherlands . . .	15,700	10,300	China . . .	1,900	800
Sweden . . .	9,500	1,300	Argentina . . .	1,200	2,400
Newfoundland and Labrador . . .	7,400	5,000			

(S. O. R.)

Grapes. Production of grapes in the United States in 1939 was reported November 1 by the Department of Agriculture as 2,470,530 tons, compared to 2,703,000 in 1938 and a ten-year average (1928–37) of 2,214,995 tons. Production in Canada was 50,444,300lb. in 1939 and 35,973,600lb. in 1938. The United States exported in the market year of July 1938 to June 1939 almost 40,000 short tons of table grapes, or 14% more than 1938 and 155% more than the five-year average, United States grapes having taken a large part of the European market previously supplied by Spain. Of the 1939 exports 15,205 short tons were to the United Kingdom, 13,923 to Canada, 15,511 to Mexico, 1,267 to the Philippines, 1,248 to Sweden, 1,135 to Cuba. Production of all varieties in California was 2,173,000 tons in 1939 and 2,531,000 tons in 1938, or 1,255,000 tons of raisin grapes, 548,000 tons of wine grapes and 370,000 tons of table grapes in 1939. In 1938 California produced 1,443,000 tons of raisin grapes, 641,000 tons of wine grapes and 447,000 of table grapes.

Production of Grapes by States, 1938 and 1939

	1939 tons	1938 tons		1939 tons	1938 tons
California . . .	2,173,000	2,531,000	Delaware . . .	2,000	1,500
New York . . .	75,600	55,600	Georgia . . .	1,830	1,660
Michigan . . .	58,100	16,900	West Virginia . . .	1,750	430
Ohio . . .	42,800	9,800	Oregon . . .	1,700	2,400
Pennsylvania . . .	23,200	15,700	New Mexico . . .	1,170	1,240
Missouri . . .	12,500	6,200	Utah . . .	840	860
Illinois . . .	8,800	6,300	Maryland . . .	750	580
Arkansas . . .	8,200	4,800	Arizona . . .	710	730
North Carolina . . .	7,500	6,600	Massachusetts . . .	700	540
Iowa . . .	5,800	5,000	Florida . . .	670	820
Washington . . .	5,400	5,500	Idaho . . .	580	590
Indiana . . .	4,800	2,200	Colorado . . .	500	650
Kansas . . .	4,100	3,100	Wisconsin . . .	490	430
Oklahoma . . .	3,200	2,500	Minnesota . . .	290	270
New Jersey . . .	3,200	2,800	Mississippi . . .	290	250
Nebraska . . .	3,000	3,100	Rhode Island . . .	230	220
Texas . . .	2,800	2,000	Nevada . . .	110	100
Kentucky . . .	2,750	2,390	New Hampshire . . .	110	70
Virginia . . .	2,600	2,000	Louisiana . . .	50	50
Connecticut . . .	2,460	1,960	Vermont . . .	50	40
Tennessee . . .	2,240	1,590	Maine . . .	30	30
South Carolina . . .	2,020	1,670			

(S. O. R.)

Graphite. Exports of graphite from Chosen in 1938 increased 13% over 1937, to 50,200 metric tons, and from Madagascar by 11% to 12,500 tons, while Ceylon dropped 32% to 11,750 tons and Mexico 28% to 8,200 tons; figures are lacking for Germany, but on the basis of past outputs, including Austria and Czecho-Slovakia, the country now has a potential output of 45,000–50,000 tons. Producers of less importance include Canada, India, Italy, Japan and Norway. Production in the United States has almost ceased. It is important to note that with the annexation of Austria and Czecho-Slovakia, Germany became at the same time the largest producer of graphite, and the only consumer of importance with a surplus supply from domestic sources; all other consuming countries are dependent on imports for most or all of their supply of graphite. (G. A. Ro.)

Grasshoppers: see ENTOMOLOGY: *Locusts and Grasshoppers*.

Gravel: see SAND AND GRAVEL.

Gray, Carl Raymond (1867–1939), American railroad executive, was born on September 28 at Princeton, Arkansas. After he had completed his preparatory training he decided to withdraw from school for a time. Finding employment with a railroad at Fayetteville, Ark., in 1883, he never resumed his formal education. He remained with his first employer, the St. Louis and San Francisco railway until 1911, during which time he rose from "helper of a station agent's helper" to senior vice president. In 1912 he became president of the Great Northern railway; in 1914 president of the Western Maryland railway. In 1918 he was director of operations under the U.S.

Government's wartime supervision of railroads. He was appointed president of the Union Pacific system in 1920 and remained in this position until his retirement on Oct. 1, 1937, when he became vice chairman of the board of directors. On Dec. 6, 1936, his 50th wedding anniversary, he and his wife were guests at a dinner attended by 1,400 prominent U.S. railroad officials. He died on May 9 at Washington, D.C.

Great Britain & Northern Ireland,

United Kingdom of. Area 93,991 sq.mi.; pop. (est. June 30, 1939) 47,680,500 (England and Wales, 41,375,000). Chief towns (pop. est. June 30, 1938): London, cap., 4,062,800; Glasgow (June 30, 1939), 1,131,500; Birmingham, 1,041,000; Manchester (including Salford), 932,300; Liverpool, 827,400; Sheffield, 520,000; Leeds, 494,000; Edinburgh (June 30, 1939), 473,200; Belfast (Jan. 1, 1939), 443,500; Bristol, 415,000; Hull, 318,700. Ruler: King George VI; premier: Rt. Hon. Neville Chamberlain; religion: chiefly Protestant Episcopal Church.

History.—It is symbolic of the misfortunes of our times, and of 1939 in particular, that none of the European great powers has time and leisure for a history of its own. Practically all that passes traditionally under the heading of home affairs, domestic politics, the continuous effort to readjust national institutions to the needs of an ever developing society, the pursuit of a better national life, and the traditional conflict of the historic parliamentary parties as to the means by which these ends should be secured—all this or almost all of it has to be cut out. Nearly all domestic activity is rearmament; rearmament is the handmaid of foreign policy, and foreign policy has been forced across the Rubicon into war. European history is once again all one, and in the worst sense.

The division of chapters of history in accordance with the calendar year is inevitably artificial, and it so happens that Jan. 1, 1939 falls midway between the making of the Munich treaty and the breaking of it. Mr. Chamberlain's Munich policy divided the country, and that was really its justification. For if only half (though probably more than half) the population supported the concessions then made to Hitler, it follows that only half would have supported with complete conviction the only possible alternative, which was war—a war the immediate cause of which, at any rate, would have been Great Britain's refusal to permit the transfer of 3,000,000 Sudeten Germans from a foreign to a German Government. The case for Munich was twofold. It was on the one hand a final test of Nazi good faith. If what Hitler had always said was true, that his only expansionist aim was the fulfilment of what had after all been the professed ideal of the victors of 1918, the adjustment of frontiers in accordance with principles of nationality, then the Sudeten crisis would indeed be the last and Hitler would settle down, like Bismarck after 1871, to a policy of stabilization; for there were, except for the special cases of the German speaking peoples in Switzerland and Alsace and certain isolated groups of Germans in Hungary and Rumania no more Germanic groups to which Hitler could lay claim. In spite of all that was hateful about Nazi methods at home and abroad, the Sudeten case was, after all, a weak case for precipitating Armageddon. The other ground of justification for Munich was that, as is now frankly acknowledged, British rearmament was, in Sept. 1938, quite insufficiently advanced.

Mr. Chamberlain's course of action immediately after his return from Munich was entirely in accordance with both these lines of argument. On the one hand he expressed a firm hope, with what degree of inward assurance we do not yet know, that Munich would prove the harbinger of "peace in our time." On the other

hand, in view of the very real possibility that it would not do so, he immediately redoubled the plan of rearmament.

On March 16 Hitler tore up the Munich agreement and on the flimsiest of pretexts annexed the Czech and Slovak remainders of what had been Czechoslovakia. The Czech country was taken into the Reich, and the old provincial names of Bohemia and Moravia restored; Slovakia retained a spectral semblance of independence, which did not prevent its subsequent use as a base for the invasion of Poland.

This ended a chapter, and with it the so-called policy of appeasement, a policy which was not proved the wrong one by the fact that it ultimately failed. In politics as in science the experiment which fails is often a necessary antecedent to the policy which succeeds.

Hitler's ambitions were now revealed beyond question; they were as unlimited as the fantasies of *Mein Kampf*. Indeed the man of action clearly intended to translate into fact the fancies of the man of letters. Lebensraum (living room), the new Nazi alias for imperialism, superseded pan-Germanism as the keyword. One can understand the German point of view. Other European peoples, British, French, Russian, even Dutch and Portuguese, being situated on the circumference of Europe, had expanded over other continents. The Germans, situated so unfortunately in the centre and only achieving the power of unity so late, must also expand. It was not primarily an economic need but something deeper and less rational, a prestige complex. Failing a dominion over non-European peoples Germany must dominate the smaller European peoples by whom she was surrounded. These peoples were not only smaller but in her view inferior, and the proper fodder of imperialism,—what Kipling, in reference to peoples enjoying the benefit of inclusion within the British Empire, had called "lesser breeds without the law."

But deeper than this was doubtless the longing of the Germans to avenge defeat. The pretext alleged was the Diktat of Versailles, but it was a mere pretext.

Whatever the faults of that treaty—and they are often exaggerated—they had practically all been rectified by 1939, except for the return of a miscellaneous and relatively unimportant collection of overseas colonies which Hitler, speaking the truth for once, had declared to be not worth a war. What rankled was the fact of defeat and the unsophisticated longing for a return match with a different result. Any schoolboy can understand this; and the power of Hitlerism is based on systematically barbarized youth. In this sinister respect war is still a sport, not of kings but of peoples, and President Wilson's earlier and derided ideal of "peace without victory" gains a fresh significance, for it may be doubted if the victory of 1918, even without the vengeance of Versailles, could have achieved the better world which the victors in the war which began in 1939 will have to try to establish.

In the new conditions inaugurated by the final destruction of Czechoslovakia, Great Britain and France at once took the initiative. Formal guarantees of protection, subsequently elaborated in treaties, were extended to the states of Eastern Europe and beyond which seemed likely to be the next victims of aggression—Poland, Turkey, Rumania and Greece. This was for Great Britain a momentous departure; for it was remembered that in 1925, while guaranteeing the "Western" Locarno treaty, Great Britain had refused to guarantee the Eastern treaty concerning the frontiers of Poland.

The guarantee to Greece envisaged the possibility of attack from Italy, who had invaded Albania three weeks after Germany occupied Czechoslovakia. On May 22 a treaty of military alliance was concluded between Italy and Germany, and there seemed every reason to suppose that a war with one of the "Axis" powers would mean a war with the other, especially as, while Germany

was conducting a furious press campaign against Great Britain, the Italian press was treating France, presumably by arrangement, to a similar series of tirades.

Meanwhile the German preliminaries to an attack on Poland were developing along all too familiar lines, the demand for Danzig and the so-called corridor of Polish territory which separated Danzig and East Prussia from the main body of the Reich, playing the same part as the demand for the Sudeten territory had played in the case of Czechoslovakia. It was obvious policy in these circumstances to bring Russia into the anti-aggression alliance. Franco-British negotiators were sent over in May, but in spite of vaguely hopeful reports little progress seemed to be made. It was a discouraging circumstance that at an early stage of the negotiations Litvinov, of recent years a strong upholder of the League of Nations, gave place to Molotov, about whom nothing favourable was known, as foreign minister of the U.S.S.R. The British Labour party blamed the supposedly "Fascist" leanings of Mr. Chamberlain for the lack of progress in these negotiations, but it is now apparent that Russia's price was the surrender of the independence of some of the Baltic states, and this was a price Great Britain was not prepared to pay. On general grounds it is obvious that Russia would wish to get back the predominantly Russian regions of eastern Poland, regions which the Polish Government had originally occupied in disregard of the frontier laid down for eastern Poland after the last war, and that on this demand she could do a deal with Germany but not with Britain. However, in July allied negotiations with Russia reached a point at which it seemed reasonable to send over a Franco-British military mission to concert measures of common military action in case of war with Germany.

On August 21 the whole situation was transformed by the news that the Nazis, the authors of the Anti-Comintern front, who had always proclaimed as their special mission the protection of European civilization from Bolshevism, were about to conclude a pact of non-aggression with Russia. Only 12 days now remained before the outbreak of the war, an interval exactly the same as that between the Austrian ultimatum to Serbia and the outbreak of war in 1914. As a matter of fact the delay was longer than might have been expected since, from the Nazi standpoint, nothing seemed to remain to be done. While Europe mobilized, various neutrals, among them Mussolini, made offers of mediation that were foredoomed to fail, and on September 1, alleging that the Poles had rejected peace terms which in fact they had never seen and which seem to have been composed solely for purposes of subsequent propaganda, Hitler sent his air force to bombard Warsaw. The next day the British and French ultimatums demanded the immediate withdrawal of German forces from Polish territory. When the time limits attached to these ultimatums had expired Great Britain and France were once again at war with Germany.

There can be no doubt that the progress made in national defence by Great Britain in the 11 months between "Munich" and the outbreak of the war was an amazing achievement, which was prolonged in crescendo during the first months of the war, in which none of the services except the navy were fully engaged. For anything approaching a Blitzkrieg (lightning war) against his principal antagonists Hitler seems to have realized from the first that he was too late. Here it is possible to mention only a few salient facts. In January the first list of areas to be evacuated in the event of war was issued, and the prime minister appealed for the enrolment of volunteers for national service. In February the first steel air raid shelters were delivered in London. By the outbreak of war a civil defence force of A.R.P. (air raid precaution) workers, 2,500,000 strong, was ready for mobilization. Trenches to hold 500,000 had been dug and steel shelters to protect 6,500,000 had been distributed. Gas masks were supplied to

the whole population. In the first few days of September 1,500,000 people, mostly children and mothers of children under five years of age, were evacuated from dangerous areas. These were precautions against a form of attack, the wholesale air raid, which has not yet been launched. Evacuation was voluntary. Not much more than half the intended evacuees availed themselves of the facilities provided, and of them a considerable number have already drifted back to their homes. The social problems, both in general and in every single "reception" household, may well provide themes for novels now being written. Whatever the evils entailed, thousands of slum children have experienced a country holiday on a scale no philanthropic society could ever hope to give them.

At the end of March the Government announced the doubling of the Territorial army, raising the numbers to 340,000. In May the Compulsory Service Bill was carried through all its stages after half-hearted opposition from the Labour party. It provided for six months' compulsory training for all men between the ages of 20 and 21. The first batches of men were called up in July, and the measure was of course later supplemented by a general measure of conscription under which all between the ages of 20 and 41, outside certain reserved occupations, are liable to be called up as required. There were a few thousand conscientious objectors, far fewer than seemed likely a few years ago, and the generous treatment accorded them avoided the bitterness that this subject aroused in "left-wing" circles during the later stages of the last war. There is, indeed, no pacifist problem in Great Britain today, and the Labour party's only quarrel with the Government seems to be that their war measures are not sufficiently drastic.

During the earlier months of the year there was a strong demand in the press for a broadening of the base of the Government, and more particularly for the inclusion of Mr. Churchill. As soon as war broke out Mr. Churchill joined the war cabinet and went to his old war-station at the Admiralty. The war cabinet consisted of nine members, most of them the heads of departments directly concerned with the conduct of the war. The leaders of the Labour and Liberal parties were invited to join the government, but refused on the ground that at present they could perform more useful service outside.

Before proceeding to outline the events of the war up to the end of the year it is necessary to mention certain events unconnected with the war which befell in the pre-war period.

When the year opened the formidable Arab rebellion against the British Government and the Jewish colony was still in progress though the worst of it was over.

The Palestine Conference in London, during February and March, ended in pre-ordained failure as neither Jews nor Arabs would even discuss each other's proposals, and the colonial secretary issued a British scheme the main feature of which was that the British did not propose to undertake responsibility for the thankless task of governing Palestine for more than 10 years. Since the war began both Jews and Arabs have for the time being laid aside their differences and undertaken to support the British Government.

In March the Spanish civil war came to an end, and General Franco's government received British recognition.

In the same month President Lebrun paid a state visit to England and in May the King and Queen made an extensive Canadian tour after which they visited President Roosevelt at Washington.

The record of social legislation, in the ordinary sense of the term, was perforce meagre, rearmament and foreign policy occupying most of the time and an even larger share of the attention of both government and parliament. When war broke out many bills of a contentious character had to be abandoned, and it was a pity

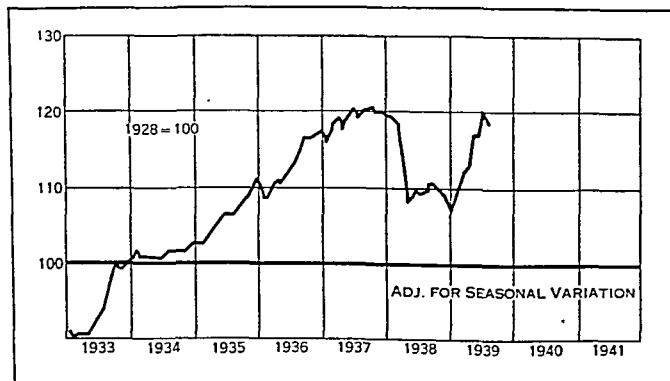
that among them was a comprehensive Criminal Law Reform Bill. Attempts were made to save it as it was for the most part an agreed measure, apart from the clauses abolishing the infliction of corporal punishment except for serious offences committed by prisoners while serving their sentences. It is, however, worth recording that in spite of the crushing burden of taxation for defence purposes there was no curtailment whatever of the social services. Unemployment fell steadily during the first half of the year and the last two months of peace showed the lowest totals (about 1,200,000) for 10 years. The first months of the war brought a rise in these figures because the dislocation of peace industries exceeded at first the development of war employment, thus repeating the experience of 1914.

The year, again like 1914, and also 1931, the year of the "great slump," suffered the misfortune of two budgets. In his April budget, Sir John Simon had to make provision for an expenditure of £630,000,000 on defence (as compared with £400,000,000 in the previous year), and of this sum £380,000,000 was to be raised by borrowing. Total expenditure for the year (April 1939–March 1940), including the sum to be borrowed, was estimated at £1,322,000,000. The standard rate of income tax was left unchanged at 5s.6d, but rates of surtax and estate duty were increased, as also the tax on private motor cars, tobacco and sugar. The estimates on which this budget was based were already out of date before the end of the session in July. On Sept. 27, 1939, Sir John Simon introduced a war budget, envisaging expenditure of practically £2,000,000,000 up to the end of the financial year.

The standard rate of income tax was now raised to 7s. for the remainder of the current year and 7s.6d. in a full year, and a tax of 60% was imposed on the profits above previous standards of all trades and businesses. By these and other additional taxes the chancellor hoped to raise just over half the estimated expenditure out of current revenue. Loans suitable for small subscribers were issued before the end of the year, borrowing from the general public on a larger scale being postponed until 1940.

Economists have been exercised in their minds by the allied problems of borrowing and inflation, and Mr. Keynes put forward a scheme for a compulsory loan, collected after the manner of income tax and repayable in the slump period which is bound to follow the war. Criticism appeared to suggest that, though the scheme might be logically sound, it was not yet, and might never be, politically feasible.

Parliament was recalled on Aug. 24, 1939, three days after the announcement of the Russo-German pact. It continued to sit for several days each week until the Christmas recess. At first its principal duty was to enact a spate of emergency legislation, prepared in advance and held in readiness for the occasion. Since then the meetings have both mirrored the essential unity of the nation and afforded a platform for outspoken criticism of ways and means.



UNITED KINGDOM: Index of business activity (*The Annalist*)

The Prime Minister's weekly reviews of progress have been supplemented from time to time by reviews of the activities of the different services by the ministers in charge of them. Among the critics, Mr. Greenwood, deputy leader of the Labour opposition, distinguished himself by the vigorous and outspoken patriotism of his utterances.

The outbreak of the war revealed, as all but the enemy expected, the unity of the Empire. Eire, it is true, availed herself of the freedom of commonwealth institutions to declare her neutrality. In South Africa, General Hertzog, intending to pursue a similar policy, was defeated in his parliament by 80 votes to 67 and replaced by General Smuts, who shares with Mr. Churchill the honour of being a leading statesman in both the German wars. Canada, Australia and New Zealand were all in from the start, and Canadian troops and Australian airmen had already reached Great Britain before the end of the year. In India the performances of Congress politicians did not conceal the profound agreement of the Indian peoples with the determination of the rest of the Empire to destroy the forces of Hitlerism, and Indian troops were already serving in France before the year ended. All other parts of the Empire served the common cause, each according to its capacity and opportunity.

The war also revealed the absolute unity and identity of the Franco-British combination. In this respect, if no other, the war in 1939 began where the World War left off. The British expeditionary forces in France were acting under the supreme command of General Gamelin, and French units within the British sections of the line were under the British higher command. In industrial and economic policy, also, the Allies were pooling their resources and acting as one. History has never before seen independent and equal powers so closely combined. They are, for war purposes, at least, two nations but one "commonwealth."

In other respects, however, the war had falsified nearly every forecast.

Those who envisaged a war in the earlier part of the year expected Germany to find an ally in Italy, possibly also in Spain, where General Franco owed his victory, at any rate in part, to Italian and German support, possibly also in Japan. It would, in fact, be a war with the whole or a part of the much boosted anti-Comintern front; yet all these countries stood neutral. Few, if any, expected the collaboration of Hitler and Stalin, even though they realized that both were equally the enemies of all that free peoples hold dear. And as in the grouping of powers so also in strategy; the Blitzkrieg from the air, the attempted knock-out blow at the heart of Germany's most powerful enemy, had not by the end of 1939 been delivered. Months passed before a single enemy bomb dropped on British soil, and then it fell on one of the Shetland islands.

It is not possible in this article to give more than the briefest outline of the events of the first four months of the war. For events of the first four months of war see BLOCKADE; EUROPEAN WAR; SHIPPING, MERCHANT MARINE; STRATEGY OF THE EUROPEAN WAR; SUBMARINE WARFARE; TACTICS IN THE EUROPEAN WAR. And, indeed, apart from the German conquest of Poland and the assault of Russia upon the liberties of Finland, it has been on land and in the air an "affair of outposts" only. On land, with Belgium neutral, the western front was less than half the length of the western front of 1914–18, and along the whole of that front the Maginot and Siegfried lines (*qq.v.*) rendered a general assault suicidal for the attackers.

In the air, British raiders over Germany had dropped leaflets instead of bombs. Air fighting on the British coast, over Heligoland and the Kiel canal and along the western front, have revealed again and again the quality of the British and French machines and the daring and skill of the British and French pilots.

The main German undertaking since the first day of the war has been an attempt by U-boats, by mines and by commerce destroying raiders, to break down the British command of the seas and to destroy the overseas commercial activities on which the very life of the country depends.

Germany started the war with about sixty submarines, and as many of these had been despatched to war stations in advance, and as British ships were engaged all over the world on their normal unconvoyed activities, the losses of the first fortnight were inevitably heavy, between a third and a quarter of the whole of the total mercantile tonnage, allied and neutral, sunk in the first four months of the war. That total, nearly 400,000 tons, however deplorable, was a quite inconsiderable fraction of the total tonnage, and was, indeed, balanced by the output of the shipbuilding program and the capture of such enemy ships as remained at sea and awaited capture before being scuttled. It seems demonstrated that the U-boats, which came so near winning the war in 1917, cannot materially affect the issue under present conditions. About forty U-boats were (Jan. 1, 1940) destroyed, and though the Germans may be building new ones as fast or faster than they lose them, it is doubtful whether they can train fresh crews of the calibre of those they are losing.

After the U-boat attack began to fail the Germans achieved some success, mostly at the expense of neutrals, by laying magnetic mines from aeroplanes; but this new (and illegal) weapon was largely mastered by a bold aerial patrol over the mine-layers' bases. Of Germany's three pocket battleships, one was damaged by an aerial attack on the German base; another, the "Graf Spee,"

MORE THAN A MILLION CHILDREN were evacuated from London and other British cities Sept. 1, 1939, to spots in the country relatively safe from air raids

after a long inning of commerce destruction in the southern seas, was brought to book by three British cruisers off the coast of Uruguay, in the most remarkable naval action of the war in 1939. Retiring injured to Montevideo, she was ordered to leave after her time had expired by the Uruguayan Government, acting in accordance with the terms of international law, and was scuttled outside the harbour by order of the German Government.

The British Navy suffered losses which, though tragic, cannot be regarded as seriously damaging. The "Courageous" and "Royal Oak" were sunk by submarines, the latter within the confines of Scapa Flow. The "Rawalpindi" was destroyed by the pocket battleship "Deutschland"; two destroyers and a number of smaller craft were lost by striking mines in 1939.

Sea-borne commerce is, of course, severely restricted, not by the successes of the Germans, but by the working of the convoy system, which is, in itself, one of the best insurances against German attack.

Nothing that happened in 1939 suggested that the Germans had any chance of winning the war along the lines on which their efforts had during that year been mainly directed. (D. C. So.)

Education.—In 1937-38: elementary, England and Wales, departments under separate head teachers 29,988, scholars on register 5,150,874; elementary, Scotland—schools 2,895, scholars 617,047; elementary, Northern Ireland—schools 1,700, scholars 191,862; secondary, England and Wales, grant-aided schools 1,398, scholars 470,003; secondary, Scotland—grant-aided schools 252, scholars 156,645; secondary, Northern Ireland—grant-aided schools 75, scholars 14,557; universities, students: England 41,707 (full time, 36,378); Wales 3,089 (full time, 2,970); Scotland 10-



Table I.
Bank of England Return Aug. 30, 1939.

ISSUE DEPARTMENT

£	£
Notes Issued:	
In circulation	529,493,805
In Banking	33,511,895
	Govt. debt 11,015,100
	Other govt. securities 284,800,006
	Other securities 3,470,820
	Silver coin 713,174
	Fiduciary issue 300,000,000
	Gold coin and bullion 263,010,700
	(at £158s 6d per oz. fine)
<u>£563,010,700</u>	<u>£563,010,700</u>

BANKING DEPARTMENT

£	£
Capital	14,553,000
Reserve	3,652,286
Public deposits	31,067,576
Other deposits:	
Bankers	90,143,424
Other accounts	38,976,243
<u>£178,392,529</u>	<u>£178,392,529</u>

Table II.
ESTIMATED REVENUE 1939-40

£	£
Income-tax	327,000,000
Surtax	70,000,000
Estate Duties	80,000,000
Stamps	21,000,000
National Defence Contribution	25,000,000
Other Inland Revenue Duties	1,250,000
Total Inland Revenue	524,250,000
Customs	232,560,000
Excise	116,170,000
Total Customs and Excise	348,730,000
Motor Vehicle Duties	43,450,000
Post Office net receipt	7,200,000
Post Office Fund	1,600,000
Crown Lands	1,330,000
Receipt from Sundry Loans	5,000,000
Miscellaneous	10,750,000
Total Ordinary Revenue	<u>£942,310,000</u>

ESTIMATED EXPENDITURE 1939-40

£
Interest and Management of National Debt
Payments to Northern Ireland
Miscellaneous Consolidated Fund Services
Defence (Army, Navy, and Air Force)
Pensions (Army, Navy, Air Force)
Civil Defence (Margin for Supplementaries)
Education
Social Services (Health, Labour, etc.)
War and Civil Pensions
Other Civil Supply Services
Margin for Civil Supplementary Estimates
Tax Collection (including Pensions £1,268,000)
Total Ordinary Expenditure

*Exclusive of amounts, estimated at £342,500,000, to be met from issues under the Defence Loans Acts, 1937 and 1939.

Table III.
REVISED (WAR) BUDGET 1939-40

£
Revenue, ordinary
Expenditure, total
To be met by borrowing

*Of which £502,430,000 had already been authorized under the Defence Loans Acts.

384 (full time, 9,841); Northern Ireland 1,590 full time students.

Banking and Finance.—Revenue, ordinary (actual 1938-39) £927,285,034; expenditure, ordinary (actual 1938-39) £926,779,724; expenditure, sinking funds (actual 1938) £13,219,181; public debt (national) Mar. 31, 1939, £8,163,000,000.

Trade and Communications.—Overseas trade in million £: imports, merchandise (1938), 920; (1939) 885.9; exports, domestic (1938), 470.8; (1939) 438.8; re-exports (1938) 61.6; (1939) 45.9; bullion and specie, net exports (1938) 73.9; imports, merchandise (Jan. 1-Aug. 31, 1938) 6.5; (Jan.-Aug. 31, 1939) 6.0; exports, domestic (Jan.-Aug. 31, 1938) 6.9; (Jan.-Aug. 31, 1939) 4.6; re-exports (Jan.-Aug. 31, 1938) 42.3; (Jan.-Aug. 31, 1939) 36.3. Communications: roads (Mar. 31, 1938): England and Wales (class I), 20,627mi.; (class II) 13,070mi.;



AS GUIDES FOR PEDESTRIANS and motorists in black-outs, the trees, poles, and curbs of London's streets are painted with white strips

Scotland (class I), 6,632mi.; (class II) 3,967mi.; Northern Ireland (class I) 1,273mi.; (class II) 1,933 miles.

Railways (Dec. 31, 1938): Great Britain, track open to traffic, excluding sidings, 20,007mi.; Northern Ireland, standard gauge, 633mi.; narrow gauge 121 miles. **Airways** (1938): distance flown 14,331,000mi.; passengers carried 222,200; mail carried 3.453 tons; freight carried 2,527 tons. **Empire Services** (Airways), traffic ton miles including passenger ton miles (1937-38) 7,153,767; (1938-39) 13,734,899; passengers carried (1939) 12,614. **Shipping**, excluding vessels under 100 tons (July 1, 1939) 17,984,158 gross tons; under construction (July 1, 1939) 791,500 gross tons; shipping (net tonnage with cargo), entered (monthly average 1938) 5,698,000; cleared (monthly average 1938) 4,907,000; entered (Aug. 1939) 6,617,000; cleared (Aug. 1939) 5,525,000. **Motor vehicles** licensed (Sept. 30, 1938): cars 1,944,394; hackney vehicles (taxis, buses, coaches, etc.) 87,730; commercial vehicles 590,397; motor cycles 462,375; total 3,084,896.

Wireless receiving set licences (Sept. 30, 1939), 9,085,050; telephones (Dec. 31, 1939): number of stations (including public and private lines, call boxes, etc.) 3,235,500.

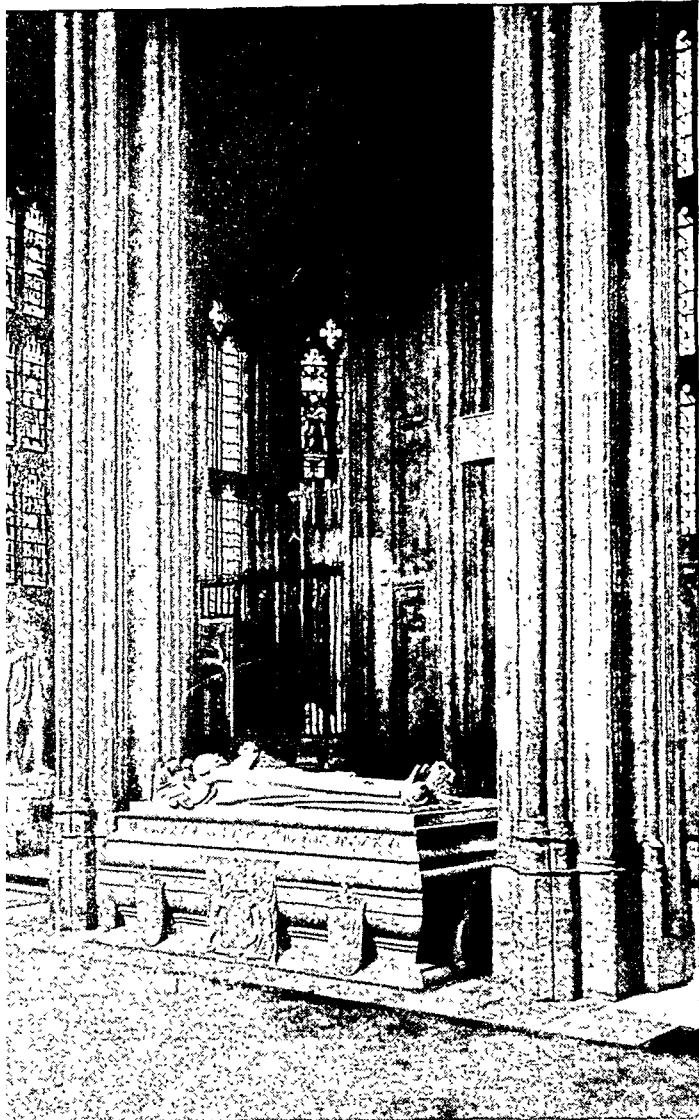
Agriculture, Manufactures, Mineral Production.—Production in 1938: (in metric tons) wheat 1,996,200; oats 2,023,700; barley 918,800; potatoes 5,197,100; beet sugar 294,200; hops 131,000; coal 231,875,000; iron ore (metal content) 3,615,000; pig iron and ferro-alloys 6,871,000; steel 10,561,000; sea fisheries (wet fish only) 1,062,665; whale oil 221,100; benzol 218,800; shale oil 132,000; beef and veal (1937-38) 688,000; pig meat (1937-38) 415,200; mutton and lamb (1937-38) 257,000; wool 50,300; wood pulp 270,000; silk, artificial 48,285; margarine 211,600; butter (1937) 46,700; cheese 44,400; flax (fibre) (Northern Ireland) 4,100; rye 10,900; lead ore (metal content, 1937) 26,800; aluminium (smelter production) 23,000; superphosphates of lime (1937) 449,000.

Production in England and Wales*

	1938	1939
Wheat	1,855,000	1,555,000
Barley	803,000	794,000
Oats	1,069,000	1,119,000
Potatoes	3,486,000	3,312,000

*Note: One metric ton = .98421 English ton.

Industry and Labour.—Index of industrial production (1929=100) av. (1938) 115.5; av. (Jan.-June 1939) 123.1; index of



STONE SARCOPHAGUS of King George V in Windsor castle, dedicated Mar. 12, 1939

employment (1929=100) av. (1938) 111.0; av. (Jan.-June 1939) 113.5. Industrial population, insured (July 1929) 14,838,000; unemployed, wholly, av. (1938) 1,423,662 (10.3%); temporary, av. (1938) 378,918 (2.8%); wholly (Aug. 31, 1939) 1,058,989 (7.1%); temporary (Aug. 31, 1939) 216,372 (1.5%).

(See also CZECHO-SLOVAKIA; DEMOCRACY; EUROPEAN WAR; JAPAN; PROPAGANDA.) (W. H. WN.)

Greece.

Area 50,147 sq.mi.; pop. (est. Dec. 31, 1938) 7,107,000. Chief towns: Athens (cap. 392,781), Salonica (236,524); ruler: King George II; language: Greek; religion: Christian (Greek Orthodox).

History.—Italy's seizure of Albania (*q.v.*) caused much uneasiness in Greece, where troops were moved up to the frontier and fortifications constructed; although the Government declared that Italy would respect Greece's integrity. On April 13 Britain and France declared that they would lend Greece all the help in their power, should action be taken which threatened her independence and which she felt it vitally necessary to resist by force of arms. After the European war broke out, however, Italy's change to a more defensive attitude eased the position of Greece. On September 20 it was announced that she and Italy were withdrawing their troops from the Albanian frontier, and on October 30 a

further exchange of notes was said "to have the effect of a Pact of Friendship." Subsequently, the press strongly stressed these friendly relations with Italy. Meanwhile, Greece's friendship with Turkey remained unimpaired, and her Balkan policy was based on the Balkan Entente. In internal affairs, the Metaxas regime continued unchanged. The two objects to which the Government devoted its chief energies were military preparedness and economic self-sufficiency, and various measures were taken directed towards each of these objects.

Education.—In 1936-37: elementary schools 9,207; scholars 1,038,974; secondary schools 522; scholars 86,957.

Banking and Finance.—Revenue (est. 1938-39) 14,519,062,942 drachmas; expenditure (est. 1938-39) 15,106,354,667 drachmas; public debt (Nov. 30, 1938) 52,127,000,000 drachmas; notes in circulation (April 30, 1939) 8,255,210,050 drachmas; gold and gold exchange reserve (April 30, 1939) 4,274,505,394 drachmas; exchange rate (1938-39) 550 drachmas=£1 sterling.

Trade and Communication.—Foreign trade (merchandise): imports (1938) 14,761,395,000 drachmas; (Jan.-Aug. 1939) 9,092,000,000 drachmas; exports (1938) 10,140,180,000 drachmas; (Jan.-Aug. 1939) 4,890,800,000 drachmas. Communications 1938: roads, suitable for motor traffic 7,708mi.; railways open to traffic 1,672mi.; shipping, tonnage (June 30, 1938) 1,872,165 gross tons.

Agriculture, Manufactures, Mineral Production.—Production 1938 (in metric tons): wheat 983,452; (1939) 960,000; wine 410,015; barley 245,504; (1939) 217,700; maize 199,484; (1939) 172,500; olive-oil 106,463; oats 152,479; (1939) 152,600; cotton 48,563; iron ore (1937) (metal content), 145,000; tobacco 41,574; potatoes 143,003; rye 61,963; (1939) 62,500; lignite (1937) 131,080.

Industry and labour: index of industrial production (1929=100) (average 1938) 165.1; workers insured against sickness, accidents, etc. (1938) 351,059.

(See also BALKAN ENTENTE.)

Grenada: see WEST INDIES, BRITISH.

Grey, Zane

(1875-1939), American author, was born at Zanesville, O. on January 31, the son of a backwoodsman preacher.

Grey in his youth studied dentistry and practised for six years in New York city before giving up his profession for writing. His first book, *Betty Zane*, appeared in 1904. His most successful novel was *Riders of the Purple Sage* (1912) which sold almost 1,000,000 copies. In all he wrote more than 50 novels, most of them about the Far West in the days of U.S. expansion toward the Pacific.

Among his other books are *Desert Gold* (1913), *The Lone Star Ranger* (1915), *Rainbow Trail* (1915), *Wildfire* (1917), *The Thundering Herd* (1925) and his last, *Western Union* (1939). He died at Altadena, Calif., on October 23.

Grinnell, Joseph

(1877-1939), American zoologist, was born at Old Ft. Sill, Okla., on February 27. He graduated from Throop Polytechnic institute (now the California Institute of Technology) in 1897 and received his master's and doctor's degrees at Stanford university. In 1900 he joined the faculty of Stanford university, and from 1908 until his death he was director of the California Museum of Vertebrate Zoology at the University of California, where he was also professor of zoology. An authority on Alaskan fauna, he presented his entire collection of 8,300 specimen skins of North American birds to the University of California in 1920. He died at San Francisco on May 29.

Groener, Wilhelm (1867–1939), German general and statesman, was born November 22 at Ludwigsburg, Württemberg. On his 17th birthday he became an ensign in the German Army and by 1912 he had been promoted to a lieutenant colonelcy. At the beginning of the World War (1914–18) he was director of railway operations for the General Staff. His promotion thereafter was rapid; in 1916 he became a major general and departmental head of the War Office, and in 1918 he succeeded Ludendorff as quartermaster-general of the army. After the war he took charge of demobilizing the defeated German troops. Under President von Hindenburg he became minister of defence (1928) and minister of interior (1931) of the republic. As minister of interior he outlawed Hitler's Storm Troops and otherwise attempted to stem the rising power of the Nazis. Nevertheless, when Hitler assumed control of the state in 1933 he permitted Groener to retire.

He died at Potsdam on May 4. See *Encyclopædia Britannica*, vol. 10, p. 903.

Guadeloupe, a French West Indian colony comprising the two large islands Basse-Terre and Grande-Terre, separated by a narrow channel, and five smaller islands, in the Windward group; language, French; capital, Basse-Terre; governor, Félix Éboué. The area is 688 square miles. The population (304,209 by the 1936 census) was estimated at 310,000 on Jan. 1, 1938. Chief cities (with 1931 populations) are Basse-Terre, 9,268; Pointe-à-Pitre, 30,465; Le Moule, 17,107. The colony is administered by a governor and an elected general council, and has representation by a senator and two deputies in the French parliament. External communication, somewhat disturbed in 1939 by the European war, is by steamer and air transport service. During the year a 278,000,000 franc public works program, including highway improvement, sanitation, harbour development at Pointe-à-Pitre, and low-cost housing, went forward. Trade is largely with France. In 1938 imports totalled \$8,465,000, exports \$11,851,000 (\$9,820,000 and \$13,545,000 respectively in 1937). Imports are foodstuffs, textiles, beverages and lumber; exports, the chief products, are sugar, rum, bananas and to a less extent coffee, cacao and vanilla. In 1938 sugar and bananas reached all-time highs in production. One-third of the entire area is under cultivation and is highly productive. There are 18 sugar mills and 94 rum distilleries. The monetary unit is the French franc (value: 2.25¢ U.S.). In 1938 the budget was balanced at 69,527,243 francs, and on Jan. 1, 1938, the outstanding indebtedness was 11,202,004 francs. (See also WEST INDIES.) (L. W. BE.)

Guam, a possession of the United States of America and the largest and most populous island of the Marianas, lies at the southern end of that group, approximately 1,500 miles E. from Manila; area about 225 sq.mi.; population on July 1, 1939, 22,843, including 21,199 natives of Guam who are called Chamorros; the remainder are foreign-born and personnel of the U.S. Naval Establishment. The capital and only city is Agana, having about one-half the total population of the island.

The island was discovered March 6, 1521, by Magellan and remained a Spanish possession until June 21, 1898, when it was captured by the United States, later being ceded to the United States by the Treaty of Paris. Since acquisition it has been under the jurisdiction of the Navy Department with a naval officer commissioned as governor by the President. The people are regarded as wards of the United States. Immigration, while not prohibited, is not encouraged and no alien may own land.

Public schools had an average enrolment of 4,217 during 1938–39. Emphasis is placed upon the English language, health and sanitation, and upon industrial and agricultural training.

Health and sanitary conditions are very satisfactory. All medical attention is given by the naval medical officers who treat the people free of charge.

Hospitalization is also provided without cost. The only bank is the Bank of Guam, conducting a commercial banking business as a division of the Treasury of the Naval Government of Guam, which owns the capital stock. Copra is the only export of importance: 2,229 tons were exported during the fiscal year 1939. The community is essentially an agricultural one. The land is fertile and native foodstuffs are plentiful. (L. S. F.)

Guatemala, second largest and most northerly of the Central American republics; language, Spanish; capital, Guatemala City; president, General Jorge Ubico. The area is 48,290 square miles. The population is 3,044,490 (Dec. 31, 1938 official estimate).

The leading cities are: Guatemala City, 166,456 (1938 census); Antigua, 40,000; Quezaltenango, 35,000 (est.); Totonicapan, 30,000 (est.); Coban, 27,000 (est.).

During 1939, the country continued quiet under the quasi-dictatorship of President Ubico, but with a noticeable growth of anti-foreign sentiment. In March the Government seriously restricted foreigners in business, and tightened immigration laws to reduce foreign control of commercial activities. In May, all alien political societies were ordered dissolved, and five months later formal warnings were given German radio officials to confine their broadcasts in the republic to the truth. During the year agitation arose for the annexation of British Honduras (conceded to Great Britain by treaty in 1859), and the Government took the official stand that British non-compliance with the treaty had invalidated it. Meanwhile, the republic drew closer to the other American nations.

Guatemala had 850mi. of railway and 3,636mi. of highway, with 792mi. under construction in 1939. Steamship and air service are the principal means of external communications.

Despite unsteady coffee prices, trade throughout the year was normal until September, when it became exceptionally active because of the outbreak of war in Europe. War conditions enabled the United States to strengthen its leading position in Guatemalan trade at the expense of Germany, normally second. Imports in 1938 were \$16,671,388 (United States, 45.7%; Germany, 35.1%), exports \$16,366,623 (United States, 69.5%; Germany, 14.1%). The United States regularly takes over 60% of the country's predominant export, coffee. Banana production, second in export importance (10,723,216 stems in 1937–38), underwent a rapid increase in 1939, due to continued development of new plantations on the west coast, while chicle, 7.7% of exports, set an all-time record. The monetary unit is the quetzal (value: \$1.00 U.S.). Guatemala has over 2,500 schools, with an enrolment in excess of 145,000 pupils. A tremendous advance in education in recent years resulted in over 50,000 pupils in schools, 2,405 soldiers, and 752 prisoners being taught to read in the single year 1937–38. Military service is compulsory. The army numbers 7,000 men.

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Guggenheim, Murry (1858–1939), U.S. financier and philanthropist, was the third of the eight sons of Meyer Guggenheim, Swiss emigrant who built a large fortune in mines and smelting plants. Murry Guggenheim was born at Philadelphia on August 12. With his father and brothers he organized in 1881 the firm of M. Guggenheim's Sons, which later became Guggenheim Brothers. In 1929 he established the Murry and Leonie Guggenheim Foundation for a dental clinic in New York city. During his lifetime the foundation granted ap-

propriations of about \$1,900,000, and to it Mr. Guggenheim bequeathed \$5,000,000 in his will, probated shortly after his death on November 15 at New York city.

Guiana, French: *see* FRENCH GUIANA.

Guinea: *see* FRENCH COLONIAL EMPIRE; PORTUGUESE COLONIAL EMPIRE; SPANISH COLONIAL EMPIRE.

Guinea, Spanish: *see* SPANISH COLONIAL EMPIRE.

Gynaecology and Obstetrics. Each year sees at least a small decline in deaths from obstetric causes. In the United States, for example, the maternal mortality has been reduced from 65 per 10,000 live births in 1931 to 44 per 10,000 in 1937.

It will be surprising if a reduction in the world's maternal death rates can be reported for 1939, and certainly not for the years of the war in Europe, because war always takes its toll of pregnant and parturient women and their babies.

Haemorrhage, toxemias, and infections still lead the list as chief causes of the fatalities. Fortunately, the majority of these are preventable. Colebrook and Purdie were responsible for the beginning of the successful use of sulphanilamide in puerperal infections. This has been found useful also in venereal (gonorrhoeal) and in renal infections such as pyelitis and cystitis. Even in this short time it is apparent that the general death-rate from puerperal infection has been definitely lowered by the discovery and use of this drug.

The problem of dystocia, or difficulty in delivery, is being met by the recent developments in Roentgen-ray pelvimetry. It is still the custom to measure the bony pelvis of each pregnant woman by means of callipers. Those that are found to show average measurements may be expected to be able to deliver babies of average size without especial difficulty. Contractions of the pelvis, as indicated by shortened measurements, lead the obstetric attendant to expect certain difficulties which must be met by appropriate measures. Many border-line degrees of pelvic contraction, and various specific types of pelvic deformities afford considerable difficulty, however, in arriving at a decision that an operative delivery is or is not necessary.

Thoms of New Haven has developed a Roentgen-ray method of making accurate measurements of the maternal pelvis with the help of a lead grid perforated at one centimetre intervals, these perforations being thrown on the film by a second exposure after having taken a picture of the patient's pelvis. Caldwell and Moley of New York have utilized stereoscopic Roentgen-ray pictures for measuring pelves, and have developed a morphologic or developmental classification of pelves. Each of these forms seems to have a typical mechanism of labour, which can be predicted with considerable accuracy.

There are certain anaemias peculiar to pregnancy, which may have serious consequences if allowed to go untreated. One of these (macrocytic) resembles pernicious anaemia, but responds promptly to liver extract therapy, alone or with iron, and is not permanent.

Some interesting new observations have been made in the behalf of diabetic women bearing children. Insulin has preserved the lives and health of many diabetic girls who formerly could not have survived to grow up into young womanhood. Many of the infants die *in utero*, due probably to the disturbance in the mother's metabolism of carbohydrates from which the foetuses derive their nourishment. Foetuses developing to term are likely to be overweight, probably from certain variations in these same metabolic processes, and of those born alive many die suddenly during the first few days after birth. Such an infant before birth seems to be stimulated by the mother's lack of insulin from her diseased pancreas and consequently produces more insulin than is

usual to help make up the maternal deficiency. This overproduction on the part of the baby continues for a time after its birth, and may burn its circulating carbohydrates (sugars) so that it develops even fatal degrees of hypoglycaemia or low blood sugar. The preventive treatment consists in giving, routinely, intravenous or subcutaneous injections of dextrose (sugar) solutions to the baby of a diabetic mother for a few days following its birth, in order to offset the excessive insulin formation until this settles down to a normal rate.

Goodall and his associates have made the recommendation that blood from the placentas of new born children be saved, rather than wasted as usual, grouped or typed by the conventional laboratory methods, preserved by the chemicals of the Moscow Institute formula and held in readiness in a "blood bank" for transfusion purposes, for obstetric, gynaecologic, or even other emergencies.

Of couples who are now childless at least 40% can have children after proper study and appropriate treatment, provided no gross lesions exist such as from maldevelopment of the male or female genital organs or actual destruction of anatomic relations as from certain inflammatory diseases or from tumour growths.

Illustrations of certain of the investigative steps in the diagnosis of the causes of sterility are shown because of their interest, as well as their simplicity but at the same time their ingeniousness. The Rubin test, devised by Isadore Rubin of New York consists in the passage of carbon dioxide gas through the uterus and the fallopian tubes for the purposes of gauging the degree of possible constriction of the tubes or egg-passages, and for distending them and opening them more widely when constricted. The uterus and tubes may be injected with an opaque medium and Roentgen-ray pictures taken to detect small tumours and tubal obstructions. The spermatozoa are now studied under the microscope not only to determine their motility but also the percentages of abnormally developed forms. Many other details of study are essential but these are among the outstanding ones.

The use of basal anaesthetics for minor and major gynaecologic operations with a consequent reduction in the amount of inhalation anaesthetics is attracting considerable attention among gynaecologists. This is effected by various combinations of analgesic and anaesthetic medication. For example, a patient in her bedroom an hour or two before operation may be given morphine and scopolamine by hypodermic injection, followed presently by a rectal injection of paraldehyde or of a preparation named Avertin (tribomethyl alcohol). She is sleeping when transported to the operating room, and usually requires considerably less inhalation administration of anaesthesia (nitrous oxide or ether) than by the older methods. Schumann of Philadelphia reports that these basal methods with or without a small amount of nitrous oxide, or with local infiltration anaesthesia, have permitted him in his clinic almost entirely to abandon ether anaesthesia even for major abdominal operations.

The use of electro-surgical cauterization, coagulation, or conization by cutting loops has now become so perfected that many patients with inflammatory lesions or old lacerations of the mouth of the uterus can be treated thus as ambulatory office patients rather than by hospitalization and operation as formerly. These procedures require special apparatus in order to avoid bleeding and subsequent constrictions of the passages, but the economic saving to the patient is tremendous.

Occasionally, because of congenital maldevelopment, it becomes necessary for the gynaecologist to dissect the tissues of the pelvic floor and to construct an artificial vaginal tract by means of tubular grafts. The operation is difficult, and the results often uncertain. This is chiefly because of the difficulty in obtaining tissue for grafting and in making it live after its implantation.

Burger, of Budapest, Hungary, has described an ingenious improvement in this operation, utilizing sterile fresh foetal membranes for the graft material.

The vasomotor disturbances from which women suffer at the time of menopause, or "change of life," such as flashes, dizziness, drenching perspiration and similar symptoms, have been treated quite successfully by the administration of oestrogenic hormone. This is an extractive from animal sources, and its preparation is laborious and costly. Consequently, as a medicine it is expensive and many persons who need it find it difficult to buy it, especially in the more concentrated dosages, and difficult to continue its use over the weeks and months of a prolonged menopause.

Chemists have identified the chemical constituents of oestrogenic hormone, and have endeavoured to prepare synthetically an identical chemical substance in the hope that this will have similar therapeutic effects. Such a substance (stilboestrol) has now been prepared at a greatly lowered cost, animal experimentation has demonstrated its harmlessness and also its clinical effectiveness, and limited quantities have been distributed to certain chosen gynaecologists in the United States, Canada and Europe for clinical use with selected patients, the effects to be carefully observed. It has not yet been placed on the market commercially, as its clinical trial has not been completed, but early reports indicate that it may be a successful substitute for the more costly extractives.

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Gypsum. After having dropped during the depression years from a peak of some 12,500,000 metric tons annually to about 7,100,000 tons, world gypsum production has recovered to a level of about 10,000,000 tons. The principal producers, with their approximate outputs are: United States 3,000,000 tons; France, Spain, United Kingdom and Canada, each about 1,000,000 tons; Germany 850,000 tons; Italy 400,000 tons; the remainder is widely distributed among some two dozen different countries, few of which have outputs as high as 100,000 tons.

The 1938 output in the United States, 2,684,000 short tons, was 12% below 1937 and less than one-half of that reached in 1925, but the output is gradually increasing, as the building industry comes back more nearly to normal.

About one-quarter of the current output is used in cement manufacture in crude form, while 1% is used by agriculture as a soil addition and 3% goes to various minor uses; the remainder is calcined and, except for some 7% that is used in the glass and ceramic industries, is absorbed in the production of plasters, wall-board, and other building products. U.S. production is supplemented by imports, chiefly from Canada, to the extent of about 20% of the consumption. Canadian production in 1938 was 1,019,000 short tons, but preliminary figures for 1939 are somewhat lower; about 80% of the output is exported, nearly all to the United States. (G. A. Ro.)

Haab, Robert (1865–1939), Swiss statesman, was born August 8 at Waedenschwil on the Lake of Zurich and studied law at the universities of Zurich, Strasbourg, and Leipzig. Later he became mayor of his native town and a member of the Zurich State council, then an official of the Swiss Federal

railways. In 1917 he acted temporarily as Swiss minister to Germany. He was twice elected president of the Swiss Confederation for the terms of 1922 and 1929. Haab died at Zurich on October 15.

Hácha, Emil (1872–), Czech statesman, was born at Trhové Sviny, Bohemia, the son of a tax administration official, and was educated at Budějovice (Budweiss) and the Charles university, Prague, where he studied law. He gained his doctorate in 1896, and from 1898 till Dec. 1916, when he became court counsellor at the administrative court of Vienna, was in the service of the provincial committee of the kingdom of Bohemia. After the revolution of 1918 he became (November 23) senate's president of the Prague administrative court in the newly established republic of Czechoslovakia, becoming second president in March 1919 and first president of the supreme administrative court in 1925. On Nov. 30, 1938, following the resignation of Dr. Benes and the interim Government of General Syrový, Dr. Hácha was elected president by 272 votes out of 312; he received the resignation of General Syrový that afternoon, and on the following day appointed a new Government under M. Beran. In 1939 he was the chief witness to his nation's final extinction. Shortly after it became apparent that the republic was about to collapse, Dr. Hácha made a hurried trip to Berlin, where he was received with due honour. In an interview with Hitler he "requested" the Fuehrer to proclaim a German protectorate over Bohemia and Moravia. Little was heard of him during the rest of 1939, except that he retained anomalous office as "president" of the Bohemian-Moravian protectorate and issued periodic appeals to the Czechs to co-operate with the Germans. A lawyer of international standing, he was long a member of the Permanent Court of Arbitration at The Hague. He is a fluent speaker of both English and German and has published Czech translations of Kipling and Stevenson.

Hair-do: see FASHION AND DRESS.

Haiti, a West Indian republic occupying the western third of the island of Hispaniola; language, French; capital Port-au-Prince; president, Stenio Vincent. The area is 10,204 square miles. The population is approximately 3,000,000, and is almost entirely Negro. The chief cities are Port-au-Prince, 125,000 and Cap Haitien, 14,000.

History.—During 1939 Haitian development was marked by continued economic uncertainty, although with more promise for the future than previously, and by definite progress on numerous projects in the national program of public works, under which several highways under construction were extended, as were irrigation and drainage works. The national agricultural program was marked by the distribution of seedlings of coco-nut, lime, banana, coffee and other plants, with the triple objective of furthering diversification, extending the area under banana cultivation, and improving the quality of coffee, the republic's leading export crop. In the fiscal year ending Sept. 30, 1939, exports were in the main greater in volume, but with proportionately less increase in value. Coffee, increasing 17% in quantity, was valued at but 8% more than in 1938. Cacao exports were 15% greater in volume, but 12% less in value; sisal 4% more in volume, 16% less in value. Banana exports, however, were approximately 30% greater in both volume and value. Cotton, nominally less in quantity, was 16% greater in value. Sugar volume increased by 11%, but was 31% greater in value. War in Europe, while momentarily disrupting Haitian foreign trade, gave promise of eventual benefit.

Education.—Haiti has over 400 primary and secondary schools, with a total enrolment of over 50,000. The University of Haiti

is at Port-au-Prince.

Finance.—The monetary unit is the gourde, fixed by law at 20 cents U.S. The gross public debt on Sept. 30, 1939, was \$10,427,400, against \$8,790,000 on Sept. 30, 1938. Fiscal control is in the hands of a financial adviser nominated by the President of the United States.

Trade and Communication.—External communication is by sea and by air. There are 164mi. of railway and in excess of 1,000mi. of motor highway. Imports for the fiscal year ending Sept. 30, 1939, totalled \$8,180,737 in value, a 7½% increase over the previous year, and comprised textiles, foodstuffs and miscellaneous manufactured goods. Exports were \$7,267,655, a 4% increase, and comprised coffee (51.2%), sugar (14.05%), cotton (13%), bananas (7.8%), sisal hemp (7.44%) and cacao (1.7%). Imports came largely from the United States (62.96%), with Great Britain (13.78%), Germany (5.65%), France (5.12%), the Netherlands and Netherlands West Indies (3.38%), Belgium (2.71%) and Japan (2.38%) next in order. These represented a sharp increase from the United States (55.09% in 1937-38), and nominal declines for Great Britain and Germany. Exports were taken by the United States, 34.73% (43.11% in 1937-38); France, 20.96%; Great Britain, 18.88%; Belgium, 10.29%; Denmark, 5.19%; Germany, 3.14%; and Netherlands, 1.55%. (See also DOMINICAN REPUBLIC.) (L. W. BE.)

Halliburton, Richard (1900-1939?), American author, was born in Brownsville, Tenn., on January 9. He moved to New Jersey in his infancy and attended school there. After graduating from Princeton in 1921, he set out upon a series of planned adventures, which included climbing the Matterhorn, Fujiyama, Olympus and Popocatepetl. His favourite pastime was the duplication of famous feats of history. Like Byron, he swam the Hellespont. He solemnly retraced the travels of Ulysses as recounted in the *Odyssey*. In 1928 he "relived" Cortez's conquest of Mexico and Balboa's march across Darien. Following the path of Hannibal, he rode an elephant from Switzerland across the Alps to Turin. His accounts of these and other exploits were published in *The Royal Road to Romance* (1925), *The Glorious Adventure* (1927), *New Worlds to Conquer* (1929), *The Flying Carpet* (1932), *Seven League Boots* (1935) and other volumes which sold a total of more than 1,000,000 copies. In Feb. 1939, he began a voyage from Hongkong to San Francisco in a Chinese junk. On March 23 his craft is believed to have struck a typhoon west of Midway island and foundered.

"Ham and Eggs" Pension Bill: see ELECTIONS.

Hammer Throw: see TRACK AND FIELD SPORTS.

Hand-ball. Hand-ball, a sport which thrives on actual participation rather than attendance, attracted increased numbers in 1939. Playgrounds, high schools, colleges and other media offer additional facilities yearly to both men and women of all ages. The classic event is the national A.A.U. four-wall championship, held every year. In 1939, the Olympic Club of San Francisco, California, was the host with entries representing every section of the country. The winner in the singles, for the fifth consecutive year, was Joseph Platak of the Lake Shore Athletic Club, Chicago. In the doubles, Edward Linz and Frank Coyle of the New York Athletic Club were the victors for the second year in succession. National four-wall rankings for 1939 are:

- Singles**
1. Joseph Platak, Chicago
2. Jack Clements, San Francisco
3. Walter Plekan, Buffalo

- Doubles**
1. Edward Linz and Frank Coyle, New York
2. Joe Gordon and J. L. Goldsmith, Long Beach, Cal.
3. G. Cappell and R. Maguire, San Francisco

There is considerable interest manifested in the one-wall game, which is played almost exclusively in the East. New York city has been the scene of all the national tournaments in this branch of the game and is considered to have the best players in the country.

National one-wall ratings follow:

- | Singles | Doubles |
|------------------------------|--|
| 1. Harry Michitsch, New York | 1. George Baskin and Harry Goldstein, New York |
| 2. Joseph Garber, New York | 2. Morton and Seymour Alexander, New York |
| 3. Harry Goldstein, New York | 3. M. Orenstein and Ben Sheiber, New York |

Women's Rankings (one-wall only, New York Metropolitan District):

- | | | |
|----------------|-------------------------|----------------------------|
| 1. Lucy Caruso | 2. Mrs. Blanche Goodman | 3. Hannah Singer (Fr. Ro.) |
|----------------|-------------------------|----------------------------|

Harbours: see RIVERS AND HARBOURS.

Harper Prize Novel: see LITERARY PRIZES: *United States*.

Harrington, Francis G. (1887-), U.S. commissioner of the Works Projects Administration, was born September 10 at Bristol, Virginia. He graduated from the U.S. Military academy in 1909 and after being commissioned second lieutenant in the Corps of Engineers, served at various military stations in the United States and was in charge of a construction crew during the building of the Panama canal. At the outbreak of the World War he was assistant professor of mathematics at West Point. During the war he was instructor at various officers' training camps, commanded several different regiments, and was in France for a time. Upon his return he was an assistant engineer in charge of maintenance at the Panama canal and was subsequently assigned to the general staff of the War department in Washington. From 1935 to 1938 he was assistant administrator and chief engineer of the Works Progress Administration; on Dec. 23, 1938 he was appointed to succeed Harry L. Hopkins as administrator. In the early months of 1939 he testified several times before a congressional committee in an effort to prevent Congress from reducing the appropriation for relief and applying restrictions to projects of his agency. He and President Roosevelt both dealt firmly with the WPA national strike in July following passage of the relief bill June 30 which imposed a 130-hour month on WPA workers. When the WPA (renamed the Works Projects Administration) was united in 1939 with other agencies into the Federal Works Agency, Col. Harrington remained in charge of WPA operations as commissioner.

Harvard University, oldest institution for higher education in the United States, completed the third year of its fourth century in 1939. At the end of the fiscal year, June 30, 1939, investments exclusive of land, buildings and contents used for educational purposes stood at \$140,185,769. Gifts during the year were \$2,779,718 for capital account and \$1,348,967 for immediate use.

Scholarships and other student aids totalled \$707,329, exclusive of student loans. The year 1939-40 began with an enrolment of 8,379 full time students and a faculty and educational administrative staff of 1,984.

In the undergraduate college, changes were made in the departmental concentration system to overcome dangers of student overspecialization in fields of study; a Bureau of Supervisors for guidance and tutoring was established; and English composition course requirements were stiffened. The central administrative offices of the university, located in University Hall since 1815, were moved to old Massachusetts Hall. The administration adopted a faculty committee report setting up new rules for faculty tenure. Professor George H. Chase was appointed to the new position of

Dean of the university. Professor William S. Ferguson was named Dean of the Faculty of Arts and Sciences and two new assistant deans of the faculty were appointed to strengthen the liaison between university executives and the faculties of arts and sciences on matters of appointment and promotion. A new Committee on Educational relations, concerned with the relations between Harvard and other institutions in the placement of teachers, was established and Dean Henry W. Holmes of the School of Education was named chairman. Francis T. Spaulding was appointed Associate Dean of the School of Education. The university library, largest university library in the world, had 4,079,541 volumes and pamphlets on June 30, 1939, an increase of 136,280 over the previous year.

Hatay, The: see EUROPEAN WAR; TURKEY.
Hats for Women: see FASHION AND DRESS.

Hawaii. The Territory of Hawaii consists of a group of eight larger islands and numerous islets in the Pacific ocean between latitudes 18°55' and 22°15' north and between 154°50' and 160°30' west longitude. Their total area is 6,438 square miles. The islands are of volcanic origin. From south-east to north-west, they are Hawaii, Kahoolawe, Maui, Lanai, Molokai, Oahu, Kauai, Niihau. In addition, stretching north-westward beyond Niihau over 1,100 miles is an archipelago of rocks, reefs and shoals which includes Midway (longitude 177°22' west) recently notable as the first stop beyond Honolulu of the trans-Pacific clipper planes. Likewise, 960 miles south of Honolulu and a part of the city and county of Honolulu lies Palmyra, a coral atoll consisting of fifty-five islets, five miles long and two and a half miles wide. The youngest island, geologically, and the largest in the group is Hawaii, with an area of 4,030 square miles.

The capital of the Territory is Honolulu, situated on the island of Oahu. It is a completely modern city with a population (1930 census) of 137,582. Oahu is the scene of the United States' strongest fortifications in the Pacific. Hawaii's population of 368,336 in the 1930 census is estimated at approximately 415,000 in 1939. The racial origin of this population, in addition to the native Hawaiians and Caucasians from the mainland, is Japanese, Chinese, Korean, Filipino, Portuguese. 81% of the population, however, is native born.

Immigration into the Territory except for citizens from the American mainland, has ceased.

The governor and Territorial secretary are appointed by the President. Otherwise the Territory is wholly self-governing. It elects to Congress every two years a delegate who has a voice in the House of Representatives but no vote. The governor in 1939 was Joseph B. Poindexter; and the delegate, Samuel W. King. The Territory collected in taxes and fees \$14,468,991 in 1939 and expended \$14,631,310. In addition, Federal taxes were paid into the U.S. Treasury of \$11,766,650.72, exceeding the payment of 17 States of the Union.

Agriculture.—Hawaii's chief crops are sugar and pineapples. Expert management, scientific methods and costly irrigation works have raised the sugar production to a maximum of 1,035,548 tons in 1933 with a value of \$66,482,181. The value of the 1938 sugar shipments was \$50,743,327. The pineapple industry, next in importance, dropped to 594,561,333lb. with a value of \$38,409,875. Other agricultural crops are coffee, macadamia nuts, papayas and taro, a root used by the natives in making the native "poi" and also now being processed into flour.

The tourist industry has developed rapidly in the last two decades, reaching a total of 50,175 tourist visitors in 1939. One characteristic of Hawaii, unique among all regions under the American flag, is that there are no billboards. (E. GRU.)



HAWAIIAN LEGISLATORS were entertained with hulas at the opening of their 1939 session in Honolulu February 15

Hawthornden Prize: see LITERARY PRIZES: *Great Britain.*

Hay. Supplies of hay in the United States for the 1939-40 feeding season were reported by the Department of Agriculture as 100,000,000 tons, made up of a current crop of 84,000,000 tons and a carry-over of 16,000,000 tons. This compares with a 103,000,000-ton supply of the preceding year, but is 13,000,000 tons larger than the ten-year average (1928-37). Production of all tame hay in 1939 was 75,023,000 tons and 80,299,000 tons in 1938; wild hay, 8,999,000 tons in 1939 and 10,444,000 tons in 1938.

Production of Tame Hay by States, 1938 and 1939

	1939 tons	1938 tons		1939 tons	1938 tons
Wisconsin . . .	5,764,000	6,470,000	Virginia . . .	1,010,000	1,118,000
Iowa . . .	4,700,000	4,007,000	Utah . . .	965,000	1,051,000
Minnesota . . .	4,535,000	4,893,000	Texas . . .	940,000	1,012,000
New York . . .	4,225,000	5,430,000	Maine . . .	915,000	935,000
California . . .	4,140,000	4,352,000	Wyoming . . .	849,000	933,000
Illinois . . .	4,147,000	4,083,000	North Carolina . . .	820,000	863,000
Michigan . . .	3,504,000	3,714,000	Oklahoma . . .	755,000	815,000
Ohio . . .	3,487,000	3,695,000	South Dakota . . .	727,000	870,000
Missouri . . .	2,700,000	2,251,000	West Virginia . . .	709,000	802,000
Indiana . . .	2,693,000	2,815,000	Georgia . . .	666,000	631,000
Pennsylvania . . .	2,687,000	3,283,000	Alabama . . .	601,000	662,000
Idaho . . .	2,167,000	3,323,000	Arizona . . .	559,000	403,000
Montana . . .	1,842,000	1,940,000	Massachusetts . . .	496,000	575,000
Washington . . .	1,833,000	1,707,000	Maryland . . .	491,000	543,000
Tennessee . . .	1,672,000	1,850,000	South Carolina . . .	475,000	431,000
Colorado . . .	1,616,000	1,863,000	Connecticut . . .	396,000	516,000
Kentucky . . .	1,581,000	1,720,000	New Hampshire . . .	384,000	405,000
Oregon . . .	1,522,000	1,480,000	Louisiana . . .	361,000	333,000
Nebraska . . .	1,464,000	1,709,000	Nevada . . .	344,000	370,000
Kansas . . .	1,153,000	1,171,000	New Jersey . . .	294,000	357,000
Vermont . . .	1,144,000	1,090,000	New Mexico . . .	266,000	268,000
North Dakota . . .	1,078,000	1,162,000	Delaware . . .	84,000	91,000
Mississippi . . .	1,078,000	1,086,000	Florida . . .	55,000	56,000
Arkansas . . .	1,020,000	980,000	Rhode Island . . .	53,000	58,000

Clover and timothy were 24,320,000 tons in 1939 and 27,754,000 in 1938; alfalfa, 27,139,000 tons in 1939 and 28,858,000 in 1938. (See ALFALFA.) These figures do not include sweet clover and lespedeza. (S. O. R.)

Hay Fever: see ALLERGY; AIR CONDITIONING: *Physiological Benefits.*

Health Program, National: see DENTISTRY; MEDICINE.

Heart and Heart Diseases. Three distinct gains have been effected. Most important was the treatment of subacute bacterial endocarditis, often called malignant endocarditis, a fatal disease caused by the *Streptococcus viridans* usually implanted on chronic heart disease of rheumatic or congenital origin. Hitherto recoveries have been excessively rare, variously recorded as from less than 1% to 3%. A recent careful survey of 250 cases studied during the 15 years from 1924 to 1938 inclusive showed only one recovery (0.4%). The disease starts insidiously when a bacterium or a chain of the streptococci floating in the blood stream, as may happen in an otherwise perfectly normal person who has some focus of infection in tooth, tonsil, or other part of the body, becomes implanted on a little clot or thrombus that has become attached to a rough surface or scarred area of the lining of the heart, especially of the mitral or aortic valves of the left ventricle. The streptococcus begins to multiply, if it finds its environment satisfactory, and soon establishes a thriving colony which begins to protect itself from the effect of any antagonistic action of the blood stream around it by a coating of fibrin and blood platelets. The disease spreads, new colonies form on surrounding regions of the lining of the heart valves and chambers and the blood is constantly invaded by the germs that break off from these colonies or still enter the circulation from the original foci of infection. The victim begins to feel sick and feverish, becomes weak and anaemic, and some days or weeks after the disease starts he consults a physician who may at first be puzzled to know what kind of an infection is going on. The presence of old heart disease in a person who is usually still young (the majority of cases are in the two decades from 15 to 35), the finding of the *Streptococcus viridans* by blood culture, certain other signs which are often present (enlarged spleen, clubbing of the fingers and small skin haemorrhages) and the absence of evidence of other types of prolonged infection, such as typhoid and tuberculosis, establish the diagnosis of this dread disease. Fortunately it is not common, making only about 2% of all cardiac cases, attacking one out of every 25 rheumatic heart patients and about one out of every ten congenital heart patients. For about six months on the average (varying from two months to a bit over a year) the patient drifts along to death despite transfusions and all sorts of potent and impotent drugs and other measures. Such was the situation at the opening of 1939. Even sulphanilamide, introduced so successfully in the treatment of certain other serious more acute streptococcus infections, had largely failed. But sulphapyridine was coming in and several recoveries by the use of this drug took place during 1939. The greatest promise of all, however, has come through the experience of Kelson and White in Boston who combined the drug sulphapyridine (an anti-bacterial remedy) with another relatively new drug heparin, an anti-coagulant, which, given intravenously in constant drip, doubtless tends to prevent the formation of the thrombi on the heart valves on which the streptococci grow. These workers report three recoveries in the first seven cases that they treated with these two drugs in combination (one of these cases relapsed after two months but was given another course of treatment). There are dangers from the use of either drug alone and only the greater danger of this fatal disease justifies running the risks of

the treatment. Much more must be learned about the technique of the treatment and about the cases best suited for it (presumably the earlier or milder cases), but for the first time there is some light from the horizon which was previously almost pitch black. Probably also by the skilful use of sulphapyridine during such procedures as the removal of an infected tooth, in a person already affected by some chronic rheumatic or congenital heart damage, this dread disease may be prevented.

The second interesting and important new treatment of heart disease also began in Boston. For years various students of the subject have advised that a certain congenital defect called patency of the ductus arteriosus be corrected by surgical ligation, but nothing was done about it until an unsuccessful attempt was made by Graybiel, Strieder and Boyer in Boston early in 1938. Later the same year, and since then in 1939, Gross of Boston with the medical help of a number of associates, particularly Hubbard, successfully operated on six cases. The ductus arteriosus which in foetal life shunts blood from the right ventricle and pulmonary artery directly into the aorta (instead of through the lungs) normally closes at birth or soon after; if it remains patent, it not only is a hazard because of the possibility of infection by the *Streptococcus viridans*, but, if widely patent, it also increases a good deal the work of the heart and leads to enlargement and heart muscle strain. The third therapeutic measure of special interest is connected with Goldblatt's notable discovery of a few years ago in which he demonstrated that a high (but not complete) degree of obstruction of the circulation to the kidney of an experimental animal by a clamp on the arteries causes high blood pressure during the period of obstruction. It has been found that some instances of high blood pressure in man may arise from a considerable degree of damage to or disease in one kidney and that removal of that kidney may result in a return of the blood pressure to normal. A few notable instances have been recorded, thus calling attention to the need of determining the state of the kidneys in all cases of hypertension.

A helpful development in methods of study of the heart has come with the application of the ingenious device of the lag screen to electrocardiography, allowing the immediate visual inspection of the electrical curves of the heart's action, by the so-called cardioscope, without waiting for the development of the photographic film of the electrocardiogram which can be carried out directly afterwards if one desires to keep a permanent record. Finally, a set of accurate life size models of normal and various kinds of abnormal hearts has been constructed by Spillane which show in particular the relationship of the heart chambers and great vessels to each other and to surrounding structures (spine, oesophagus and trachea) following the original model of Taipale of Finland. These are very helpful for X-ray study and for teaching.

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Heath, Lady Mary (1895?–1939), British aviatrix, was born Sophia Mary Peirce-Evans at Limerick, Ireland. Shortly after her marriage in 1927 to Sir James Heath, wealthy British ironmaster, she began a career in flying which lasted scarcely two years but brought international atten-

tion to her exploits. In Oct. 1928 she established a world's altitude record of 24,700ft. for light planes—the highest any woman had ever flown. In 1928 she flew the treacherous 10,000-mi. route from Cape Town to London.

Thereafter she made a tour of the United States, then became a licensed pilot of the Royal Dutch Airlines. Her career as an aviatrix ended at Cleveland, Ohio in Aug. 1929, when her plane crashed through a factory roof and she was critically injured. In 1931 she married George Anthony Reginald Williams, an aviator from the British West Indies. She died after a fall in a London tram on May 9.

Heavy Carbon: see ISOTOPES, SEPARATION OF THE.

Heavy Hydrogen: see ISOTOPES, SEPARATION OF THE; MATTER, STRUCTURE OF.

Hejaz: see ARABIA.

Helium. The only commercial sources of helium in the world are the natural gas fields of south-western United States. The Cliffside helium reserve, covering 50,000ac., which supplies the Government-operated helium recovery plant at Amarillo, Tex., has an estimated reserve of 100,000,000,000 cu.ft. of natural gas with 1-8% helium and produced 361,065,000 cu.ft. of gas, while the recovery plant produced 6,099,960 cu.ft. of helium in the fiscal year ending June 30, 1938, an increase of 27% over the preceding year; the estimated cost of production was \$14.25 per 1,000 cubic feet. The bulk of the output is supplied to the army and navy for aircraft use, but during 1938 contracts were made for the sale of 800,000 cu.ft. to private parties. Mixed with oxygen, helium is a valuable substitute for air in the treatment of asthma, laryngitis, croup and diphtheria, as the effort required for the breathing of this mixture is only about half that required for air. The medical consumption during 1938 was about 200,000 cubic feet. The difficulty known as "bends," suffered by divers and caisson workers when coming out of high pressure, is due to the liberation in the capillaries of small bubbles of nitrogen which had become dissolved in the blood under heavy pressure; this may be obviated by the use of a helium-oxygen mixture instead of air, since helium is insoluble in the blood, but as yet the cost of helium is too high to make its use possible under ordinary working conditions. The use of helium for the inflation of toy balloons is being promoted, in order to avoid the liability of injury to children from the explosion of hydrogen-filled balloons.

The substitution of helium for hydrogen in test balloons by the U.S. Weather Bureau will require some 1,500,000 cu.ft. annually.

(G. A. Ro.)

Heller, Edmund (1875-1939), U.S. naturalist, was born at Freeport, Ill., on May 21 and was educated at Stanford university, where he received his bachelor's degree in 1901. While still an undergraduate student he joined the university's zoological expedition to the Galapagos islands and was an assistant naturalist for the U.S. Bureau of Biological Survey in Alaska. From 1901 to 1907, as a naturalist with the Field museum in Chicago, he made explorations in California, Mexico, Guatemala and East Africa. In 1909 and 1910 he was with the Smithsonian African expedition under the direction of Theodore Roosevelt.

In later years he led explorations in many other parts of the world—in Peru, China and Siberia. He was director of the Milwaukee Zoological Gardens from 1928 to 1935 and of the Fleishacker zoo in San Francisco from 1935 until his death. He wrote numerous articles on fishes, reptiles and birds and was co-author with Theodore Roosevelt of *Life Histories of African Game*

Animals. He died at San Francisco July 18.

Hemp. The International Institute of Agriculture at Rome, which normally gives quite comprehensive reports on the output in the principal hemp-producing countries, reported production of only one country in 1939, that of Bulgaria, which produced 14,483,300lb. of hemp fibre, compared to 9,061,000lb. in 1938. The Institute, however, reports the acreage planted to hemp in principal countries in 1939 and 1938. From acreage figures and the known 1938 production some estimate of 1939 production may be made.

Hemp Acreage and Production

	Acreage 1939	Acreage 1938	Production 1938
U.S.S.R.	986,000	1,248,000	*
Italy	224,000	225,000	239,487,000lb.
Germany	39,000†	32,000‡	260,000lb.†
Bulgaria	23,000	25,000	9,061,000lb.
Yugoslavia . . . . .	..	141,000	122,135,000lb.
Rumania . . . . .	..	120,000	66,790,000lb.
Manchoukuo . . . . .	..	89,000	38,422,000lb.
Poland . . . . .	..	83,000	28,306,000lb.
Japan . . . . .	..	17,000	19,487,000lb.
Syria . . . . .	..	12,000	7,637,000lb.
France . . . . .	..	9,000	9,231,000lb.

*The latest Russian production reported is the average for 1933-34, which the International Institute of Agriculture recorded as 447,247,000 pounds. The current five-year plan is said to have called for hemp planting of 1,354,000 acres in 1939, but the Institute reported planting of only 986,000 acres.

†Includes Sudetenland and Austria.

‡Does not include Sudetenland and Austria.

(S. O. R.)

Heredity. The application of a recently developed statistical technique has led Burks to report the first case of autosomal linkage in man. The characters concerned—hair colour and a tooth defect—are not themselves capable of simple genetic analysis, but the data indicate that they are dependent in part on linked genes.

The ability to taste phenyl thio urea has been known for some time to be inherited as a simple dominant in man. It has also been known that tasters constitute about 70% of the population, with no marked difference in the frequency in the various races tested. Fisher, Ford and Huxley have now shown that approximately the same relative numbers of tasters and non-tasters occur also in chimpanzees. Irwin and his co-workers have continued their studies of specific antigenic properties in the red blood cells of hybrid doves and pigeons. They have shown that the pairs of species studied differ in a series of separately inherited antigens, and that each antigen is inherited as a simple dominant. Extensive studies show that some of these antigens are present in other related species. These studies are furnishing a solid foundation for the application of serological techniques to the problems of phylogenetic relationships. It also seems likely that the antigens concerned are rather direct gene products. Studies in this field may be expected to throw much light on the nature of development and of mutation.

Little has reported that the frequency of spontaneous tumours is much higher in hybrids between ordinary house-mice and the oriental *Mus bactrianus* than in either parental strain. This result seems likely to furnish a new starting point in the study of the inheritance of spontaneous cancer. Another result of crossing has been recorded in *Drosophila pseudoobscura*, where Sturtevant has shown that the crossing of two semi-cross-sterile races leads to a marked increase in mutation frequency.

Older work showed that the frequency of mutations induced by X-rays is proportional to the dosage. Several investigators have now studied the dosage relations for chromosome breakage, and have shown that two types may be distinguished—"one-hit" aberrations, due to a single ionization, and "two-hit" aberrations,

due to two separate ionizations. The former, like mutations (many of which are in fact due to chromosome aberrations), show a linear relation to dosage. The latter increase with dosage in approximately an exponential manner. A complication here is that, when a chromosome is broken, the broken ends commonly fuse—either to restore the original arrangement or with other broken ends. If the original composition is reformed, as in the first case, no visible aberration results. In the second case an aberration may be detected. It follows that the results will depend on the number of breaks present in a cell and on their distribution in time and space. The time element has been studied by Sax, who finds that, in *Tradescantia* microspores, broken ends may remain open and capable of reunion for about an hour.

Another X-ray result has been reported by Kaufmann, who finds that breakages are not distributed at random in the X chromosome of *Drosophila*. (See GENETICS.)

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Highways: see ROADS AND HIGHWAYS.

Hiranuma, Kiichiro (1867–), Japanese statesman, was born September 28 at Okayamaken, the son of a samurai. He was educated at the law college of Tokyo Imperial university, where he graduated in 1888. Some two years later he was a judge in the Tokyo court of appeal, and in 1906 he became director of the Bureau of Civil and Criminal Affairs. In 1923 he was appointed minister of Justice. The next year he was nominated peer, and in 1926 he was created a baron. On Jan. 4, 1939 he was named premier to succeed Fumimaro Konoye. His foreign policy, like that of his predecessor, was based on strict adherence to the anti-Comintern pact and friendship for Germany (see JAPAN). It was all discredited in one blow by the Nazi-Soviet pact of non-aggression. He resigned August 28 and was succeeded by Nobuyuki Abe (*q.v.*).

Hispanic America: see LATIN AMERICA.

Hispanic America and the European War.

When the war against Hitler began in Sept. 1939, the 20 Hispanic American republics found themselves faced with economic disruption, and threatened with possible involvement in the conflict itself. German steamship and air transport lines shut down their service in the Western Hemisphere, while British and French shipping activity was considerably curtailed and functioned under irregular and secret schedule. Under such circumstances the Hispanic American republics were threatened with loss of markets and deprival of needed supplies. They therefore saw a need for unity of action, and, accordingly, at the suggestion of Argentina, Colombia, Cuba, Mexico, and Peru, along with the United States, President Juan Demóstenes Arosemena of Panama put into motion the machinery created at the Pan American Conference at Lima in Dec. 1938, that is, the provision for joint consultation of the foreign ministers of member states of the Pan American Union in the event of common danger. On September 4 he formally invited the representatives of the 21 member republics to meet in conference at Panama. The announced agenda included consideration of measures to keep the American continent free from the European conflict, and programs for preserving the commercial and financial interests of the several republics, as well as discussion of measures for the maintenance of strict neutrality within their territorial limits.

On September 23, representatives of all the American republics met at Panama in what came to be known as the Panama Conference. By that time, however, consideration of defence meas-

ures took precedence over all other points under discussion, due to rumoured activity of both surface and underwater belligerent craft in American waters, and to the Russian invasion of Poland. After nine days of both public and private discussion of possible courses of action, the Conference approved (October 2) the Declaration of Panama, under which the American nations proclaimed a broad safety zone in American waters for inter-American shipping, and made a general declaration of neutrality in the European conflict. The zone began at the United States-Canadian border on the Atlantic and covered the shipping lanes of the entire American continent, extending northward along the Pacific coast to the United States-Canadian border. In the Pacific it was broadened to include the Galápagos islands, while undisputed possessions of European states were excluded. Among the provisions of the neutrality proclamation were: acknowledgment of individual decisions on the admission of undersea craft; establishment of two permanent committees, one of seven international law experts to determine violations of neutrality, the other of 21 delegates to discuss economic and financial problems arising out of the war; opposition to contraband lists; provision for uniform standards of neutrality. On October 4, the participants in the European conflict were formally notified of the declaration and asked to respect the neutrality of the individual nations.

Subsequent to the Panama Conference, the Inter-American Fiscal Conference was held in Guatemala in November, and the Inter-American Financial, Economic, and Advisory Council at Washington in the same month. Their general objectives were the adjustment of economic and financial problems of the several American republics arising out of the economic dislocation of the war. No formal decisions and conclusions had been announced by the close of the year. Meanwhile, in December, the international law committee (comprising members named by Argentina, Brazil, Chile, Costa Rica, Mexico, Venezuela and the United States) began to sit at Rio de Janeiro. Hardly had its meetings begun when it was faced with the problem of the violation of the safety zone in the battle of Punta del Este, off the Uruguayan coast, in which three British cruisers defeated the German pocket battleship "Graf Spee." The "Spee's" flight to Montevideo compelled Uruguay to impose a time limit on its stay there, with the alternative of internment, despite German protests. Her subsequent departure and scuttling by her own crew in the mouth of the Rio de la Plata and arrival of the crew in Argentina gave that nation the necessity of interning the crew, again over German protest. The German steamer "Tacoma," which had served as an auxiliary to the "Graf Spee," was likewise ordered interned in Uruguay. Concurrently, seizure of the German steamer "Dusseldorf" 12 mi. off the Chilean coast and other, similar seizures caused resentment at the disregard of the safety zone. A joint protest of all the American republics at the violation of the neutrality zone in the battle of Punta del Este was delivered to the belligerents.

The several Hispanic American members of the League of Nations, led by Argentina, took the initiative in forcing the expulsion of Russia from the League (December 14) as a result of her attack on Finland. Trade effects of the war by the close of 1939 were, notably, the practical cessation of a German trade which had represented 17% of all Hispanic American foreign trade in 1938, the diversion of British and French shipping, with heavy increases in purchases of certain products, notably meats from the Plata republics and Brazil, and tin from Bolivia, and a heavy increase in neutral trade, especially by the United States and Japan. Politically, Western Hemisphere solidarity was more nearly a reality than ever before. (See also EUROPEAN WAR.)

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Hispaniola: see DOMINICAN REPUBLIC; HAITI; WEST INDIES.
Historical Association, American: see AMERICAN HISTORICAL ASSOCIATION.

Hitler, Adolf (1889–), German statesman, was born at Braunau on the Inn in Austria on April 20. After residence in Vienna where, as a painter, he formed his anti-Marxian and anti-Semitic convictions, Hitler moved to Munich in 1912. Here, in Aug. 1914, he enlisted as a volunteer in a Bavarian regiment and fought throughout the World War. In July 1919, at Munich he joined as "Number 7" Anton Drexler's German Workers' Party, which soon developed into the National Socialist German Workers' Party, popularly known as the Nazis. Herr Hitler quickly became its Leader (*Fuehrer*) and for a time edited its official newspaper, the *Völkischer Beobachter*. In the so-called Munich Beer Hall Putsch of Nov. 9, 1923, Hitler attempted with Ludendorff, Goering, Frick, Streicher, Roehm and others to seize the Bavarian Government, but was arrested, tried for treason, and condemned to imprisonment at Landsberg. Here he dictated to his secretary, Rudolf Hess, his famous book, *My Struggle* (*Mein Kampf*), of which more than 2,500,000 copies were later sold, thus providing the author with an abundant income. It is in part an autobiography and in part an exposition of his ideas for the regeneration of Germany, and is hence sometimes called the "Nazi Bible." On his release from prison in Dec. 1924, as a result of a general amnesty, he devoted himself to building up various organizations to strengthen the Nazi party: Brown Shirts, Elite Guard (*Schutz-Staffeln* or "SS"), Hitler Youth (*Hitler Jugend*) and other formations. With the aid of these, with efficient lieutenants, and with his magnetic oratory, his Nazi party grew rapidly in power, winning 12 Reichstag seats in 1928 and 230 in July, 1932. On Jan. 30, 1933, Hitler was appointed Reich Chancellor and began the social and political revolution establishing the "Third Reich." Upon Hindenburg's death on Aug. 1, 1934, Hitler succeeded him as president, but modestly refrained from using the title and is known simply as Reich Leader (*Fuehrer*) and Chancellor. For events in Hitler's career from 1934 to 1939 see GERMANY. (S. B. F.)

Hockey: see ICE HOCKEY.

Hogs. War and the largest world supply of vegetable and animal fats and oils on record affected hog production and prices in sharp diversity in different countries in 1939. Early in the war the United Kingdom contracted with the Canadian Government to maintain a large and staple supply of hams and bacon for Great Britain, at fixed prices advantageous to producers. In the Danube basin apparent competition between Germany and Italy to obtain pork products operated advantageously to growers. But in the United States average prices of hogs per head were \$7.79 when the Agricultural Department's annual livestock estimate was made Jan. 1, 1940, whereas a year earlier the price was \$11.21 per head. The number of hogs on U.S. farms Jan. 1, 1940, was 58,312,000, compared to 49,293,000 head Jan. 1, 1939. But the total value Jan. 1, 1940, was \$454,280,000, compared to \$552,626,000 a year earlier. Thus with 8,919,000 more hogs Jan. 1, 1940, the total value of all hogs was \$98,346,000 less. While lard exports increased in 1939 over 1938 their volume was scarcely sufficient to affect hog prices in the United States. The fall pig crop in 1939 (June 1 to December 1) was 31,985,000 the largest in 16 years of record and comparable to 27,651,000 in 1938. The total pig crop in 1939 (spring and fall) was 84,302,000 compared to 71,101,000 in 1938 and a ten-year (1928–37) average of 71,752,000. Department of Agriculture economists believe the 1939 high production marks the end of the upward swing in hog num-

bers that began in 1938, and that spring farrowing in 1940 will approximate or be slightly under that of 1939. Slaughter of hogs under Government inspection in the United States was 36,131,404 the first 11 months in 1939 and 31,840,331 in the same period in 1938.

Hog numbers in other countries in 1939 and 1938 were:

	1939	1938		1939	1938
Canada	4,294,000	3,486,900	Yugoslavia . . . . .	..	3,450,884
United Kingdom	4,390,100	4,383,100	Lithuania	1,117,080	1,093,120
England & Wales	3,510,100	3,564,300	Bohemia-Moravia		
Northern Ireland	627,100	561,500	Protectorate	1,607,191	1,949,934
Scotland	252,900	257,400	Belgium	960,372	871,556
Germany	22,482,654	20,806,304	Latvia	891,470	813,500
Hungary	3,885,643	3,110,160	Switzerland	880,000	922,807
Denmark	3,230,000	2,706,000	Netherlands	1,553,418	1,537,783
Czecho-Slovakia (Jan. 1, 1939)	2,082,733	2,523,988	New Zealand	683,000	756,000
			France . . . . .	..	7,127,000
			U.S.S.R. . . . .	..	30,600,000
			Sweden . . . . .	..	1,371,000

The foregoing figures are from Government sources and the International Institute of Agriculture. (S. O. R.)

Holland: see NETHERLANDS.

Home Building, Federal: see FEDERAL HOME LOAN BANK SYSTEM; HOUSING.

Honduras, a Central American republic; language, Spanish; capital, Tegucigalpa (pop. 35,000); President, General Dr. Tiburcio Carias Andino. The area is 46,332 square miles. The population was officially estimated in 1935 at 962,685 and unofficially at approximately 1,000,000 in 1939. In 1939 the economic situation continued difficult, although the total production of bananas was somewhat increased. During the year attention was given to proposed large-scale production of hemp, a product hitherto produced only experimentally.

In Jan. 1939 congress repealed the 1937 law creating a differential customs tariff for certain countries, and, at the same time, imposed a 50% duty on the products of some countries, principally those of Japan. External communication is by steamship and Pan American Airways. Airlines connect Tegucigalpa with the coast. Honduras has approximately 600mi. of railway and 280mi. of inter-coastal highway, with a recently-completed 90mi. stretch of the Inter-American highway. Foreign trade in 1937–38 showed a substantial decrease in exports, although the volume of imports declined only slightly. Imports in 1937–38 totalled \$9,467,388; exports (chiefly bananas, with some gold) aggregated \$7,356,388. The greater part of the foreign trade is with the United States. The monetary unit is the lempira (value \$.50 U.S.). The 1939–40 budget called for a total expenditure of 11,403,000 lempiras, a slight reduction from the previous fiscal year. According to the last official estimate (1936) there were 965 elementary schools with 33,461 pupils out of 80,000 of school age. There are 93 secondary schools (2,857 enrolment), and two normal schools. The Central university is at Tegucigalpa. (L. W. BE.; C. N. G.)

Hops. Production of hops in the United States in 1939 was 38,570,000lb. as against 35,261,000lb. in 1938.

The yield per acre for the United States was 1,236lb. in 1939

	1939 lb.	1938 lb.	1928–37 average lb.
Oregon	19,400,000	16,434,000	18,352,000
California	10,350,000	9,152,000	8,695,000
Washington	8,820,000	9,675,000	7,032,000

and 1,191lb. in 1938. The yield per acre in Washington was 1,800lb. in 1939 and 1,935lb. in 1938; in California, 1,500lb. in 1939 and 1,366lb. in 1938; in Oregon, 1,000lb. in 1939 and 830lb. in 1938. Owing to the war, detailed figures on the European hop crop are not available, but reports are that 1939 production approximates that of 1938. Although acreage is smaller the German Brewing Industrial Association estimated the crop as about that of 1938 since hop yards abandoned were marginal areas of low yield. The crop in Yugoslavia was estimated at between 5,500,000lb. and 5,700,000lb. in consular reports. In the protectorate of Bohemia and Moravia the 1939 crop was reported as 9,900,000lb. compared to 7,738,000lb. in 1938. The 1939 acreage in the United Kingdom was reported as 18,800ac. compared to 18,500ac. in 1938. (S. O. R.)

Hormones: see CHEMISTRY, APPLIED; CHEMOTHERAPY; DENTISTRY; ENDOCRINOLOGY; GYNAECOLOGY AND OBSTETRICS; MEDICINE; PHYSIOLOGY; PSYCHOLOGY; STERILIZATION; SURGERY; UROLOGY.

Horse Racing. During 1939 new records were established in the United States in numerous different departments of turf affairs. Racing being now a year-round sport it proceeds continuously from January 1 to December 31, allowing only for the Sabbath intermissions—while at New Orleans during the winter and just over the border at Agua Caliente, Mexico, it proceeds on that day as well. It is therefore no wonder that the previous top figures for the number of days of racing, the number of races run and the amount of money distributed in stakes and purses were all displaced by new ones.

In money, \$15,312,189 was paid out to the owners, trainers, breeders and riders of winning horses, as against \$14,946,609 in 1938; the number of races run rose from 16,250 (1937) to 16,966; the number of days of racing from 2,140 (in both 1937 and 1938) to 2,199. These increases were registered without any increases in the number of different race courses already existent, for the year saw no new ones of importance thrown open. They were due to expansion at the established plants and indicated a corresponding increase in the success attending them. As previously recorded, this success has been the result of the legalization, now nationwide, of race-track betting and the supervision of all recognized meetings by State racing commissions created for the purpose by the different commonwealths. This betting, done through the machines ("totalizators") devised for the purpose, produces most of the revenue from which the upkeep of the meetings and the taxation paid into the State treasuries is derived. Up to the end

JOHNSTOWN CROSSING THE FINISH LINE of the 65th Kentucky Derby May 6, 1939, ahead by six lengths



of 1939 the totalizators had not been installed at any of the New York tracks, where the old-fashioned "book-making" system of wagering prevailed. But in the fall of 1939 a referendum, in the shape of a poll of the electorate, was held and by a decisive majority the adoption of the machines was voted. They are expected to be in operation in 1940.

The leading winning owner of 1939 was William Woodward, of New York, whose Belair Stud Stable won \$284,250, the largest sum of the kind amassed since 1935. This was due chiefly to the fact that Mr. Woodward owns two of the year's outstanding horses, Johnstown and Fighting Fox, which between them earned over \$200,000. Johnstown took the Kentucky Derby, the Belmont, Withers, Dwyer and other great stakes and Fighting Fox the \$50,000-added Massachusetts Handicap. Second on the list was Charles S. Howard, of San Francisco, whose stable won \$246,900; while third was W. L. Brann, of Maryland, with \$222,545. During the season the stables of ten different owners won \$100,000 or more.

At the close of the campaign the three-year-old colt Challedon, bred and owned by Mr. Brann, was both critically and popularly hailed as "the Horse of the Year." Starting in 15 races and winning 9, he earned \$184,535, placing him at the top of the list. His rivalry with Johnstown during the early part of the season, in the great three-year-old events, and thereafter with the four-year-old Kayak II in the all-aged ones, were the most memorable features of 1939. In four meetings with Johnstown he won twice, while he beat Kayak in both their clashes. Kayak, owned by Mr. Howard, was bred in Argentina and imported untried into this country when three. In March he won the \$100,000-added Santa Anita Handicap, which he followed with another victory in the \$50,000-added Hollywood Gold Cup. Then brought East, he disposed of everything he met except Challedon, their final meeting to decide the championship taking place at the Pimlico track, Baltimore, Md., on November 1, when after a hard and very close race Challedon defeated him by half a length. Kayak won 8 of his 11 starts and \$170,875.

The season was also notable for the appearance of what was believed to be the best two-year-old seen in a long while. This was Bimelech, bred and owned by E. R. Bradley, of Kentucky, who was undefeated, winning 6 straight races and \$135,090.

Harness Turf.—The season of 1939 was extremely successful and marked a further return to large popularity of this peculiarly American type of horse racing. The "Horse of the Year" continued to be the grey gelding Greyhound, owned by E. J. Baker, of St. Charles, Illinois. He made no formal attempts to lower his championship mile record of 1:55½, made in 1938, being used for other purposes, but showed his accustomed prowess. When sent against the two-mile record of 4:10½ he lowered it to 4:06. When hitched double with Rosalind (1:56¾), the champion mare, the two first lowered the record for pole-teams from 2:03¼ to 1:59, and subsequently to 1:58¼. Similarly, the pacing champion, Billy Direct (1:55), owned by Messrs. McConville and Downey, was not sent against his best mile record, but was started to beat the half-mile track record, which he reduced from 2:01 to 1:59¾.

In the competitive arena the bold figure was the three-year-old colt Peter Astra, owned by Dr. L. M. Guilinger, of Andover, Ohio. He won all the principal stakes for the age, 9 in number, without defeat, and earned in excess of \$45,000. (J. L. HE.)

Great Britain.—The flat racing season of 1939 will be remembered chiefly as revealing one of the greatest colts in turf history. This was Blue Peter, whose four victories in Lord Rosebery's colours included the Two Thousand Guineas and the Derby.

The outbreak of war was responsible for the suspension of racing from September 3 to October 18, when it was resumed at Newmarket. A skeleton program was then arranged which included

substitute races for such normally important events as the Cambridgeshire, the Cesarewitch and the Manchester November Handicap.

The St. Leger had to be cancelled, but there is little doubt that Blue Peter would have won the last of the year's classic races, and so joined the select band of horses who have won what is known as the Triple Crown. As it was, the stake money won by this great colt amounted to £31,964, and it enabled Lord Rosebery and his trainer, J. L. Jarvis, to head the lists of winning owners and winning trainers respectively. An American owner, R. S. Clark, won the One Thousand Guineas and the Oaks with his French-bred filly, Galatea II, trained at Manton by J. Lawson.

The best of the two-year-olds was Tant Mieux, but he was beaten in the Middle Park Stakes by M. M. Boussac's colt Djebel, sent over from France after the war had begun.

A feature of the season was the success gained by Lord Carnarvon with five yearlings he had purchased the autumn of 1938 at the Saratoga sales. Four of the five won races.

Gordon Richards was champion jockey for the 13th time in 14 years with 155 winners. He has now ridden 2,586 winners during his career. The King's jockey, J. Crouch, was killed in an aeroplane disaster on his way to the Newcastle races in June. A new totalization record was set up when the machine took £61,608 on the Derby. The Grand National was won by the Irish horse, Workman, owned by Sir Alexander Maguire. (A. K. B.)

Horses. In anticipation of a huge war demand for draft animals, as in 1914 at the outbreak of the World War, prices for horses and mules in the United States rose sharply in Sept. 1939, but by November had dropped back to almost August levels. No war demand had developed up to Jan. 1, 1940, owing to the extensive motorization of European armies and owing to the war having assumed a static quality along the French Maginot and the parallel German Siegfried lines. Germany for three years had been building up reserves of horses and mules by purchase from nearby countries. Great Britain and France drew on farm horses for immediate army needs as the 1939 crop season was about over. Should the war develop movement, with a break through or around the heavily fortified Maginot and Siegfried lines, it is believed there will be a demand for horses and mules from the United States and Canada, the most available source of supply for Great Britain and France. In the autumn of 1939 foreign military officers investigated the supply of cavalry as well as artillery horses in the United States. Military authorities point out that the wars in China, Spain and Ethiopia demonstrated that tanks, trucks and aeroplanes have not entirely displaced the need for horses and mules, especially over muddy terrain.

The horse population in the United States declined about 700,000 to 10,400,000 in 1939 and mules from 4,307,000 in 1938 to about 4,250,000 in 1939 owing chiefly to further increase of tractors on farms. These estimates are by Wayne Dinsmore, secretary of the Horse and Mule Association of America, long a nationally recognized authority. (See LIVESTOCK for the Agriculture Department's estimate of the number of horses and mules on United States farms as of Jan. 1, 1940, and for the numbers in other countries in 1939.) During the first six months of 1939 the Horse and Mule Association of America conducted a nationwide educational campaign, and about 1,500,000 horses were vaccinated against sleeping sickness (equine encephalomyelitis). The loss in 1939 was small. (See also LIVESTOCK; SHOWS; VETERINARY MEDICINE.) (S. O. R.)

Horticulture. Europe's war began to affect horticultural activities in many parts of the world almost as soon as hostilities commenced. Holland was among the first of the

continental countries to encounter these effects, for England immediately cancelled hundreds of orders for tulip bulbs and other Dutch bulbs. English growers being Holland's largest customers, this was an economic blow. Fortunately, most of the bulbs destined for the United States were en route or had been delivered. The Netherlands Government then announced rather severe restrictions, largely reducing the planting area, in the conviction that shipments in 1940 might also be curtailed to a large extent. This fact will have an important effect on the florists' trade in the United States. It is quite true that a large industry in the growing of daffodils has been built up in the North-west and in other sections, but the production of tulip bulbs in America is very limited. Probably not more than one-fifth of the millions of tulips planted each year in the United States are grown on the American continent. However, this industry has been developed to fairly large proportions in Michigan and elsewhere, and growers have been encouraged to increase their plantings in anticipation of a wider market.

It is felt in the trade, however, that a serious shortage of tulip bulbs will be experienced in 1940, and a less severe shortage in narcissi, hyacinths and other Dutch bulbs. Of course, all other countries which use these bulbs will be in the same situation.

Another shortage, resulting from the war, began within a few weeks. Lilies-of-the-valley are flowers which can be used by florists the year around, inasmuch as their forcing is a simple matter. Most of the bulbs ("pips," in the trade) come from Germany under normal conditions and are especially prepared for forcing. Naturally, the importation of these bulbs almost entirely ceased soon after the war started. A very limited source of supply has been developed in the United States.

Several million bales of dried peat, usually spoken of as peat moss, are used in the United States each year. Large quantities are also used in other countries. Coarse grades are commonly purchased by poultrymen and farmers to provide scratch litter in poultry houses and bedding for farm animals. Finer grades are used extensively by nurserymen, florists and amateur gardeners for improving the soil and for mulching plants. In recent years, a very large business has been done in the importation of peat from Germany, Holland, and Sweden. This business was cut off almost immediately when the war began, because peat is bulky and therefore requires an undue amount of shipping space. The scarcity of imported peat seems likely to build up a peat-producing industry in the United States, although little machinery for drying and processing the peat was on hand, when this situation presented itself. The rapid drying of the peat is a particularly difficult problem to solve. There are, however, immense beds of excellent peat in various parts of the U.S., and the industry has been growing in Michigan for several years. Maine, among other States, has extremely large peat deposits, and a product called Florida humus is being produced in a fairly large way in Florida.

The eastern part of Canada, particularly Nova Scotia, has extensive apple orchards and under normal conditions a large part of the crop is shipped to England. The autumn of 1939 found this market greatly reduced, and Canadian apple growers had difficulty in disposing of their crop at satisfactory prices. Great quantities of apples were placed in cold storage in anticipation of a better market in the spring of 1940. The Canadian situation was reflected somewhat in the United States, depressing the market.

Naturally, ornamental horticulture was largely wiped out in war-torn Europe within a few weeks after hostilities commenced. This was made especially evident in England, where the famous Kew Gardens, as well as the Royal Horticultural Society's Wisley Gardens were promptly taken over for military use in anticipation of air raids. They offered a particularly good opportunity for the installation of anti-aircraft guns. Many of the valuable books



THE "WORLD'S FAIR ROSE," which received first award in the 1940 All-America Rose Selections, Floribunda classification, is a rich-red flower of 20 petals

and paintings of the Royal Horticultural Society in London were removed from the society's buildings to places of safety outside the city. Plans for the great Chelsea Flower Show and other exhibitions were promptly cancelled. This is a picture which seems to be duplicated throughout the British isles and, of course, in France, Germany and other countries subject to wartime threats. An attempt was made to maintain to some degree the growing and distribution of flowers, especially in England, as an antidote to the war fever. However, florists were fearful that bombs might bring destruction to the many acres of glassed-in gardens in the tight little isle.

Perhaps the most significant advance in the United States in 1939 was the growing use of chemicals and drugs in plant cultivation. Much attention has been given to the use of colchicine to increase the size of flowers and fruits. This is a drug which has long been used by medical practitioners for rheumatism and gout. It seems to have magical effects on certain plants, but its use is purely experimental. The growing of plants by chemical nutrients and without soil has passed out of the sensational stage and is being put to a practical test in many green-house estab-

lishments. The fact seems to be pretty well settled that certain flowers—roses and carnations, in particular—can be grown cheaply and advantageously in gravel on green-house benches, when fed the proper chemical fertilizers. This phase of horticulture is still confronted, however, with many problems.

Much has been written of late about the rapid increase in dangerous pests with which horticulturists have to deal. The Japanese beetle is a particularly obnoxious pest throughout the Eastern States, and fear is expressed that pests of this type may eventually get wholly out of control. This is not likely to happen, however, although it is true that the balance of nature has been completely upset by civilized modes of living. Destruction of birds and other wild creatures has done much to lessen nature's ability to deal with pests and a very serious attempt is being made by several organizations and by the Government to restore and maintain wild life, wherever possible. However, greater dependence is being placed upon insecticides, the production of which has grown to such an extent as to reach a business running to \$100,000,000 annually, based on retail sales in the United States. This includes the control of insects affecting stored crops and other products, as well as those growing in fields or orchards. Commercial aeroplane dusting has been developed rather widely in cotton-growing sections. This plan has possibilities in the protection of forest trees.

For several years test gardens have been maintained in different parts of the U.S. for trial plantings of new annuals. The annual flowers, which receive the greatest number of votes from a jury, are called All-America selections and receive considerable publicity on that account. A similar competition for roses is now to be instituted. Rose test gardens have been established and judges named. As a preliminary, several new roses were passed upon late in 1939, one of the roses chosen being World's Fair Rose, which was seen by thousands of visitors at the New York Fair. There is one result of the long-continued depression, which has had a profound influence on horticulture on both sides of the water. High taxes and reduced incomes have compelled the owners of large estates to close them or to greatly curtail the number of employees. This fact has thrown many competent gardeners out of work and many of them are not likely to obtain new positions comparable to those which they have occupied in the past. The same causes have seriously affected landscape architects, inasmuch as few large places are being laid out. In the end, however, this probably will have a beneficial effect on landscape work in general by bringing about a tendency to give more attention to small places and by making it possible for amateurs to obtain the advice of landscape architects at a reasonable fee. (E. I. F.)

Hosiery: see RAYON; SILK AND SILK MANUFACTURE.

Hospitals. The major development of concern to hospitals has been the outbreak of war. While it has most seriously affected hospitals in the strategic centres involved and to a great extent all hospitals in the countries involved, it has also had definite effect on the hospitals in many neutral countries, owing to the cutting off of supplies and equipment from belligerent or other neutral countries. Hospitals in the capitals of the warring nations have had to make elaborate preparation against attack: subterranean bomb-proof shelters for patients and personnel, in some instances with emergency operating units and case rooms; decontamination units; sandbagging of roofs, windows and entrances; the training of nurses to combat incendiary fires; camouflaging of exposed buildings, enrolment of volunteer and other auxiliary aids. The evacuation of civilian patients from London, for instance, was a major undertaking; some 104 hutment hospital schemes, with 1,037 huts providing 38,120 beds, were

erected in southern England to supplement the other local hospital beds taken over for these evacuated patients. On the Thames a number of hospital vessels staffed by doctors and nurses were on patrol to rescue and give first-aid to people rescued from the river or its banks during air raids. In France a 5,000-bed hospital for air raid casualties was erected a few kilometres from Paris. Of serious concern has been the dislocation of the personnel of hospitals due to enlistments, etc. Financial readjustments have been extensive. In London one bright spot has been the closer relationship between governmental and voluntary agencies.

Hospital Construction.—Apart from war construction in Europe, the most extensive hospital construction in 1939 was in Latin America.¹ Fine new up-to-date hospitals have been erected at Lima, at Buenos Aires, at Havana, in Caracas, Rio de Janeiro, Sao Paulo, and many other centres. A modern medical centre, including a hospital, a school of nursing and a medical school, has been completed at Jerusalem, and fine buildings have been erected at the American university at Beirut. One of the largest and most modern groups to be built in Europe is the recently built Louis Pasteur hospital at Colmar, France. This 600-bed hospital is placed diagonally across a square site, the corner in front being occupied by the administration unit and the corner behind being allocated to the tuberculosis building. The five-storey main building is divided vertically into services on the assumption that vertical transportation is easier than horizontal. The New Westminster hospital in London is the latest British construction.

Hospital Care and Other Insurance.—Much progress in voluntary hospital service plans has been made in the United

¹Aristides A. Moll, "Hospital Development in Latin America," *Hospitals* (Chicago XIII-11, Nov. 1939).



THE WORLD'S LARGEST CANCER INSTITUTE, Memorial hospital, was opened June 14, 1939, in New York city

States. The approval of plans by the American Hospital Association has done much to eliminate the unsound, profit type of plan. The outstanding development of 1939 was the setting up of a research service to analyze financial and statistical returns, to make studies of comparable financial and actuarial experiences and to develop uniform methods of accounting, statistical terms, and definitions. Though under the Council on Hospital Service Plans of the American Hospital Association, this research program is supported exclusively from special assessments on the various plans. In Great Britain the King Edward's Hospital Fund of London set up a new plan for low income individuals, giving full hospital maintenance with medical and specialist care as well as various other benefits. In Canada, the Associated Medical Services, Inc., sponsored by the medical profession gives general practitioner, specialist, hospital, and nursing coverage.

The Administrative Field.—Several studies of wide international interest have been published by the International Hospital Association. These include studies of public relations, construction, equipment, power and heating, transportation, and training in administration. The American Hospital Association committees have made special studies of tuberculosis in general hospitals, insurance coverage, and hospital nursing costs.

Legislation.—The comprehensive health insurance plan introduced into New Zealand providing medical, hospital and other benefits has encountered considerable delay due to the strong opposition of the medical profession to the maternity bonus provided. In the United States the postponement of the Wagner National Health Act, unsatisfactory from the viewpoint of hospitalization, has delayed for the present the implementation of the Federal Government's National Health program. The American Medical Association also won its appeal from a Federal grand jury indictment charging it with violation of the anti-trust laws by alleged interference with the participation of doctors and hospitals in a Washington, D.C., hospital insurance scheme. The appeal court ruled that the practice of medicine, being a profession, did not come under these laws.

Hospital Organization.—The Congress of the International Hospital Association, scheduled for Toronto, Canada, was cancelled with the outbreak of war. The headquarters may be transferred from Germany to Switzerland. At the American Hospital Association convention tentative plans were made for a Pan-American Hospital Congress. An Italian Hospital Association has been formed uniting the former separate unions of the various hospital workers. The Italian Government has put all hospitals under a new code of laws, linking the hospitals with public health activities, the director also acting as local medical officer of health. In Northern Ireland an extensive survey has been made of all hospital facilities. (G. H. Ag.)

Housing. Public housing in the United States, nationally and locally, achieved rapid and, on the whole, solid progress during 1939. For residential construction by private enterprise, see BUILDING AND BUILDING INDUSTRY. The large initial program advanced from survey and planning to construction stage and in some cases to occupancy.

The program provides about 30,000 dwelling units in addition to those cited on p. 346 as under loan contract. In the United States Housing Act of 1937 and its 1938 amendments, Congress had authorized the United States Housing Authority to lend local public housing authorities a total of \$800,000,000, covering 90% of the cost of local projects to clear slums and build housing for families in the lowest income group, inferentially the ill-housed third of the nation. (In particular communities, the ill-housed group may obviously form either more or less than a third of the population.) To bring rents within reach of the ill-housed

U.S. Housing Projects

Projects under Loan Contract with U.S. Housing Authority.		Dec. 31, 1939
Number of projects		347
Number of local housing authorities		147
Number of dwelling units		130,100
Projects under Construction		
Number of projects		145
Number of local authorities		82
Number of dwelling units		58,169
Projects Receiving Tenants		
Number of projects		14
Number of local authorities		9
Number of occupied units		4,250

group, the Act authorized USHA to make annual contributions totalling \$28,000,000, matched by local contributions of at least a fifth as much. Usually taking the form of tax remission or exemption, these local contributions are probably worth more than the required minimum. To assure continuity for the program, the Senate passed a bill in 1939 making available another \$800,000,000 for loans and \$48,000,000 for additional annual grants. The bill was still pending in the House Jan. 1, 1940. It reserves \$200,000,000 for rural housing loans and provides for home purchase by agricultural workers.

During 1939, five more States passed enabling acts, making a total of 38. The number of local housing authorities rose to 281. Many of them have already acquired valuable experience and built up efficient staffs. Regional conferences, as well as national, encourage the sharing of this experience.

Nineteen State supreme court decisions have now been rendered affirming the constitutionality of public housing and slum clearance State laws.

The process of decentralization implicit in the U.S. Housing Act was materially aided by the establishment in Sept. 1939 of seven regional offices, each headed by a regional director, with whom local authorities deal instead of far-away Washington. The decisions which a regional director is empowered to make have been increased, and this process is expected to continue. On the other hand, the number of points requiring USHA approval, even delegated to a regional director, is expected to diminish as procedure is standardized.

Technical talent of USHA and of the local housing authorities has been concentrated until recently on reducing construction cost per dwelling unit without sacrificing essential standards. In spite of the skeptics, a large measure of success has been achieved. Average net construction cost per dwelling unit in the 145 projects under contract is \$2,831, and average total development cost, including land, utilities, landscaping and non-dwelling facilities is \$4,867.

In all cases until recently the maximum subsidy has been granted with the idea that minimum income families could not be reached without it. But with more and more contracts awarded and with the early projects already tenanted, it is found that in most cases the rents are fully as low as they ought to be. Families on relief are not excluded. Further reductions in rent would tend to exclude every one else and eventually to turn the projects into institutions for problem families. A new policy has, therefore, been adopted. Maximum subsidy in future contracts will be granted only in exceptional cases.

The next major economies will be sought in management and maintenance. Where such savings are not needed to reduce rents, they can be applied to reducing subsidy, thereby spreading a given amount over a larger program.

The 21,700 PWA dwelling units continue to furnish a valuable laboratory for problems of tenant selection and management. Thirty-one projects out of 48 have been leased for operation to their appropriate local authorities and several more are about to be. The latest figures give \$11.45 as the average monthly shelter rent (without utilities) per USHA-aided dwelling in the South

and \$15.80 in the North.

Actual family income figures in two Buffalo USHA projects are of interest because the PWA project in Buffalo had been sharply criticized as out of reach of low-income families. The first 67 Negro families at Willert Park had average incomes of \$896.72, and the first 80 white families at Lakeview averaged \$957.87. Minimum incomes ran roughly \$100 less. In the South incomes of tenants are much lower. New York city, in addition to its PWA and USHA projects, has a small one under way on the lower East Side financed by a special city tax. In an earlier planning stage is a large project near the Brooklyn navy yard to be financed entirely by the State.

The Farm Security Administration continues to operate its rural and suburban projects, but is building no more of them. It is, however, as well as other agencies of the Department of Agriculture, co-operating with USHA in its plans for rural work. (See also MUNICIPAL GOVERNMENT: *Housing*; UNITED STATES: *Housing*; WASHINGTON, D.C.)

BIBLIOGRAPHY.—Mabel L. Walker and others, *Urban Blight and Slums* (1938); Michael W. Straus and Talbot Wegg, *Housing Comes of Age* (1938); Langdon W. Post, *The Challenge of Housing* (1938); *Housing Yearbook*, 1939, National Association of Housing Officials; Publications of the United States Housing Authority, 1938 and 1939. (E. E. Wo.)

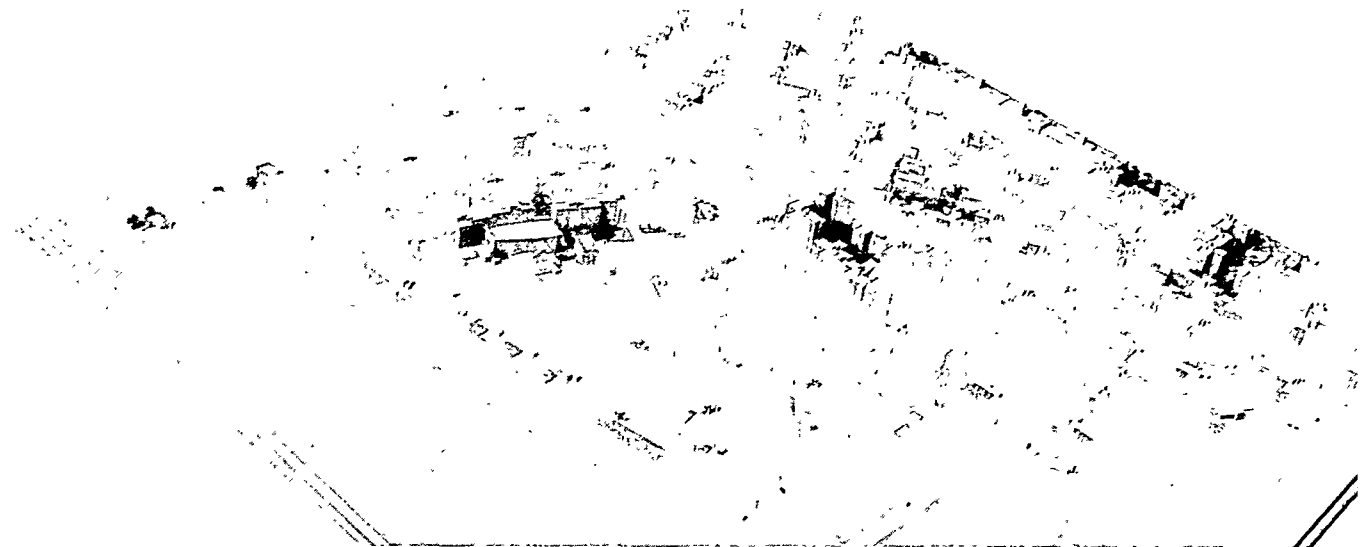
Europe.—There were no special developments in housing in Great Britain in 1939 and, of course, many of the programs in Europe and the United Kingdom were interrupted by the outbreak of war. Such housing schemes as were in the course of building are being finished off, but it is very doubtful if there will be any further schemes embarked upon in Britain for some time yet.

In Britain the attention of many people interested in housing was turned earlier in 1939 to the investigation of the problem of holiday camps which were regarded by many as being as essential as housing. The Camps Corporation appointed by the State put up a program for the building in the first place of 50 camps which were to be of such a nature as could be used for country schools and holiday centres for children taken out from the densely populated city areas. The Building Centre organized a competition for a camp to fill a triple purpose on the above lines, and there was an exhibition prior to this held at the Housing Centre.

It is generally felt, in the bigger cities particularly, that where new housing is being provided and especially in large blocks of flats, that it should carry with it an annual evacuation of children for at least a month of the year to carry on their school work in country surroundings.

The whole problem of the school camp raised again the question, which for some time past has been very seriously considered, of prefabrication of building units. This question is now being very closely studied by many housing experts in view of the probable need of speeding up of housing immediately after the war, and also on account of the present shortage of some essential building materials. Although this is by no means a new idea very little has yet been done in housing by way of prefabrication. There is, of course, the well known Swedish method where most of the housing carried out by the municipality of Stockholm in cottage form is in timber.

Prefabrication in timber is perhaps the simplest method of all and particularly in Sweden where supplies are almost unlimited. There sections of houses are made in factories; doors, windows and other units in standardized sizes are produced and taken to the site and assembled by the tenant himself. A good deal of thought was given previous to the European war to this method, more particularly in Scotland where the system was to be introduced to meet a situation very largely aggravated by the local shortage of various materials and more especially of skilled building labour.



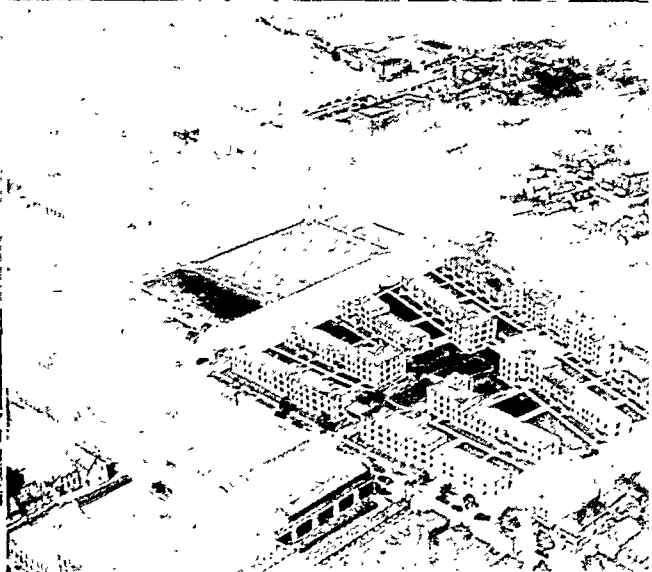
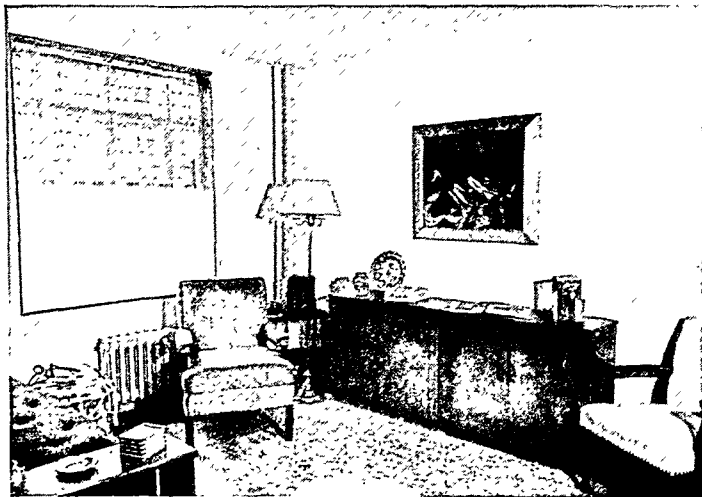
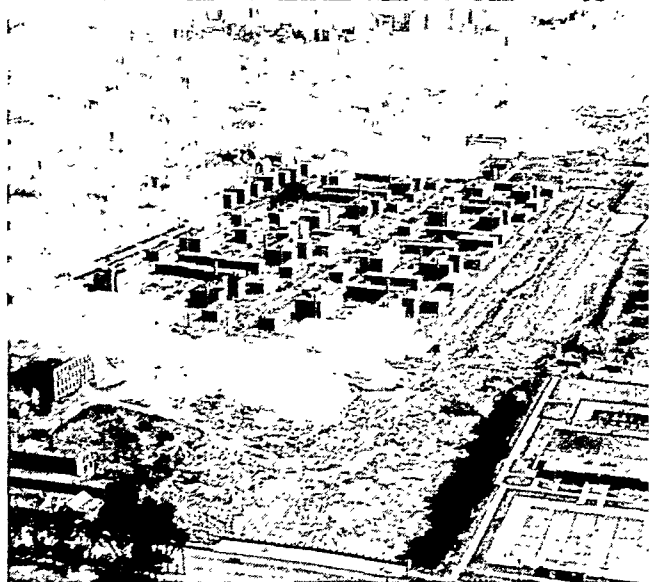
Above: MODEL OF "PARKCHESTER," \$50,000,000 private housing project of the Metropolitan Life Insurance Company in the Bronx, New York city, scheduled for completion in 1941 with 12,200 apartments

Right: AERIAL VIEW OF "LAKEVIEW" in Buffalo, N.Y., opened in 1939, which provides low-cost housing at an average monthly rent of \$13.35 per dwelling

Below, left: TYPICAL LIVING ROOM in America's largest housing project, "Queensbridge Houses" in New York city, opened Oct. 25, 1939

Below, right: "WILLERT PARK" in Buffalo, N. Y., a housing project for Negroes, opened for occupancy in July 1939

Bottom: A HOUSING PROJECT with an average monthly rent of \$17 per dwelling in New York city: "Red Hook," opened in July 1939



The other prefabricated system of any importance is that introduced in France by M. Mopin in the building of working-class flats. An extremely interesting scheme carried out on the Mopin lines was partially built during 1939 in Leeds where vast slum clearance problems had to be faced, and it was found to be very satisfactory. The final scheme is to house 5,000 families and is at Quarry Hill, and there, as in France where the system has been used, big workshops were set up on the site to prefabricate concrete units of various types which were used for the skin, floors, and walls of the steel-framed buildings.

Incidentally also in this scheme for the first time in England was introduced the "Garchy" system of refuse disposal, a system by which all the household rubbish is disposed of through a large trap in the kitchen sink whence it is carried away to incinerators on the site, and from the heat generated from the incinerators hot water is supplied. The Quarry Hill scheme generally is likely to have a good deal of influence on future housing in England, and is being studied by many as a possible system for the future.

There has been comparatively very little activity in housing on the Continent and nothing of a special nature. Spain, however, since the end of the Civil War, is making big efforts under very difficult circumstances to proceed with what is probably the first of its kind, a comprehensive program of housing and building for social services. (See also ARCHITECTURE; PUBLIC HEALTH ENGINEERING: *Housing*; TOWN AND CITY PLANNING.) (F. R. Y.)

Howard, Sidney Coe (1891-1939), U.S. dramatist, was born in Oakland, Calif., on June 26. After graduating from the University of California in 1915 he studied for a year in the playwriting class of Prof. George P. Baker's "47 Workshop" at Harvard. Then he joined an ambulance corps on the Western front and in the Balkans and, after the United States declared war on Germany, he was a captain of aviation in France. Upon his return to America he was on the editorial staff of the old magazine *Life*, of which he became literary editor in 1922. Later he wrote special articles for *The New Republic*. His first play, *Swords*, appeared in 1921; it was followed by a series of notably successful productions on Broadway which also gained for Howard the reputation of being one of the half-dozen or so of the United States' outstanding younger playwrights. *They Knew What They Wanted* (1925) won the Pulitzer play prize. Others were *The Silver Cord* (1926), *Yellow-jack* (1928), *Alien Corn* (1931), *The Late Christopher Bean* (1933), *Paths of Glory*, with Humphrey Cobb (1935), *The Ghost of Yankee Doodle* (1937), and *Madam, Will you Walk?* (1939), which was being cast for production at the time of his death. In March 1938 Howard and four other dramatists (Elmer Rice, Samuel N. Behrman, Maxwell Anderson, and Robert E. Sherwood) jointly established the Playwrights' Company to stage their own plays without benefit of other professional producers. Howard also prepared the scenarios for *Bull Dog Drummond*, *Dodsworth*, *Gone with the Wind* and other motion pictures, and translated a number of plays from the French, German, Spanish, and Hungarian. He was crushed to death by a tractor August 23 on his dairy farm near Tyringham, Massachusetts. See also *Encyclopædia Britannica*, vol. 11, p. 848.

Howard of Penrith, 1ST BARON (ESME WILLIAM HOWARD) (1863-1939), British diplomat, was born at Greystoke castle, Cumberland, on September 15 and was educated at Harrow. He entered the diplomatic service in 1885 as assistant private secretary to the earl of Carnarvon in Ireland, and the next year he was attached to the British embassy at Rome. In 1888 he was appointed third secretary of the embassy at Berlin, where he served for four years. He was a trooper

in South Africa during the Boer War and was decorated with a medal and four clasps. From 1903 to 1906 he was consul-general for Crete, from 1906 to 1908 councillor of the British embassy at Washington, from 1908 to 1911 consul-general for Hungary, and then minister to Switzerland (1911-13) and Sweden (1913-19) and ambassador to Spain (1919-24). From 1924 to 1930, as Sir Esme Howard, he was Britain's ambassador to the U.S.A., and was dean of the diplomatic corps in Washington. Upon his return to England in 1930 he was raised to the peerage. Lord Howard was the author of *Theatre of Life* (2 vols., 1935-36). He died at Hindhead, Surrey, on August 1.

Howland Island: see SOUTH SEA AND EQUATORIAL ISLANDS.

Hsu Shih-chang (1858-1939), Chinese statesman, was born in Tientsin of humble parentage and was educated at Peking. He entered Government service and rose rapidly until he became grand councillor in 1906. From 1907 to 1909 he was viceroy of Manchuria. Thereafter he occupied a series of important governmental posts, as associate prime minister in 1911, vice-president of the privy council, chief of the general staff, and Grand Guardian to the Emperor, the most exalted title of the Manchu dynasty. Hsu enjoyed the confidence of China's disunited military leaders, and it was their political support which led to his election as president of China on Sept. 4, 1918. For an account of his administration, which continued until his resignation in 1922, see *Encyclopædia Britannica*, vol. 5, p. 543 fol. He died at Tientsin on June 5.

Hungary. Area (July 15, 1939) 45,230 sq.mi.; (incl. Carpathian area); pop. (July 15, 1939) 10,817,286; (incl. Carpathian area). Chief towns (pop. Dec. 31, 1938): Budapest (1,067,523); Szeged (140,956); Debrecen (127,935); Kecs-kemét (83,573). Regent: Admiral Nicholas Horthy; premier: Count Paul Teleki; language: Hungarian; religion: Christian (1930: Catholic 64.9%; Protestant 27%; Greek Catholic 2.3%).

History.—Foreign Affairs.—On January 13 Hungary adhered to the anti-Comintern Pact, and on January 26 the foreign minister, Count Csáky, made a strongly pro-axis speech on Hungary's foreign relations; while on February 2 the U.S.S.R. severed diplomatic relations with Hungary. On April 11 Hungary resigned from the League of Nations. Meanwhile, her relations with Czecho-Slovakia had remained strained, frontier incidents being frequent (particularly one at Munkacs, January 6). On March 14, when Slovakia declared her "independence" of Prague, Hungary sent an ultimatum to Prague to evacuate Ruthenia and immediately afterwards occupied that area herself; on March 16 she declared it reincorporated in Hungary. On March 23 Hungarian troops moved westward and after some fighting occupied a further area west of the Ung. The total addition to Hungary was about 13,100 sq.km. and 720,000 inhabitants, of whom about 450,000 were Ruthenes and about 120,000 Magyars. Rumania had partially mobilized, and relations with that country remained very strained throughout the summer.

On August 25 Rumania offered a non-aggression pact, but Hungary, while disclaiming any intention of aggression, insisted on preliminary guarantees for the Magyar minority in Rumania, a condition repeated by Count Csáky on September 15. On October 7 the two countries withdrew their troops from the frontier, thanks to the mediation of Yugoslavia, with whom Hungary's relations had become very cordial; but it was clear that Hungary felt that Rumania must make substantial concessions, territorial or otherwise, if she was to enjoy Hungary's friendship. Count Csáky again indicated this in vigorous terms in a long speech on foreign affairs on Nov. 21.

Meanwhile, Hungary had remained neutral on the outbreak of war, showing thereafter a tendency to lean very strongly on Italy and, in a less degree, on Yugoslavia, while towards Germany her attitude had become rather defensive; towards the U.S.S.R. even more so, although diplomatic relations were resumed in October. The Rumanian difficulty prevented Hungary from helping to form a more solid "neutral bloc": Csáky declared that Hungary could not join such a bloc if it were directed against any outside state.

Internal Affairs.—On February 14 the premier, Dr. Imredy, resigned, being succeeded by Count Teleki, Professor Homan resuming as minister of education. Elections at the end of May gave the Government party, now known as the "Party of Hungarian Life," 183 seats, while the 28 deputies for the recovered Northern districts usually supported them. The so-called "Nyilas keresztes" (Arrow-Cross) Party, a Hungarian brand of Nazis, got 31 seats, 4 dissident Nazi parties, 11 seats, while the Small-holders' Party was reduced to 14, the Liberals and Socialists to 5 each, and the Christian Party to 4. The Government encountered repeated difficulties with the Nyilas opposition, against which it often took strong measures. This movement seemed, however, to be on the decline, for at the end of the year its candidates were heavily defeated in two successive by-elections. The chief internal measures adopted were a second, more drastic anti-Jewish law, and a modest land reform act. Autonomy for Ruthenia was promised. The German minority was allowed to constitute itself as a "Volksbund." (See also RUTHENIA; LITTLE ENTENTE.) (N. J. S.)

Education.—In 1937-38: elementary schools 6,899; scholars 963,087; continuation schools 5,740; scholars 299,321; universities 5; number of students 9,746.

Defence.—The army consists of eight army corps, four motorized brigades and two cavalry brigades. Expenditure from July 31, 1939 to Dec. 31, 1940 is estimated at 498,581,000 pengös.

Banking and Finance.—Revenue (est. July 1, 1939-Dec. 31, 1940), 2,563,194,000 pengös; expenditure (same period) 2,693,156,000 pengös; public debt (June 30, 1939) 2,088,527,230 pengös; notes in circulation (Aug. 31, 1939) 1,038,333,730 pengös; gold and silver reserve (Aug. 3, 1939) 225,403,828 pengös; exchange rate (Aug. 31, 1939) 21½ pengös=£1 sterling.

Trade and Communication.—Foreign trade, (merchandise): imports (1938) 410,607,000 pengös; (Jan.-Aug. 1939) 327,250,000 pengös; exports (1938) 522,382,000 pengös; (Jan.-Aug. 1939) 391,010,000 pengös. Communications (Jan. 1, 1939): roads, public 22,166mi.; railways, open to traffic 5,381mi.; waterways, navigable 1,139mi.; motor vehicles licensed (Dec. 31, 1938) cars and taxis 18,896; trucks, buses, etc., 5,312; cycles 10,837; telephones, number of subscribers (Dec. 31, 1938) 119,827; wireless receiving set licences (Dec. 31, 1938) 419,233.

Agriculture, Manufactures, Mineral Production.—Production 1938 (in metric tons): wheat 2,688,315; (1939) 3,069,000; maize 2,662,041; (1939) 2,250,900; rye 804,626; (1939) 896,900; barley 723,977; (1939) 780,500; oats 310,360; (1939) 356,700; potatoes 2,140,623; beet sugar 969,402; wine 3,060,000 hectolitres; lignite 8,305,827; coal 1,042,051; bauxite (crude ore) 540,315; manganese ore (metal content) (1937) 10,100; petroleum, crude 43,000; iron ore (metal content) 105,000; pig iron and ferro-alloys 334,880; steel 647,508; tobacco 20,400; hemp (fibre) 13,700; linseed 8,900. There were 3,885,643 pigs, 2,379,532 cattle, 1,868,122 sheep. Industry and labour: industrial production index (1929=100) (average 1938) 125.3; (average Jan.-June, 1939) 137.5; number employed in industry (average 1938) 1,159,690; employment index (1929=100) (average 1938) 112.3; (June 30, 1939) 125.0; unemployment, applications for work (average 1938) 47.426; (June 30, 1939) 46.876. (W. H. W.N.)

Hurdling: see TRACK AND FIELD SPORTS.

Ice Hockey played to 5,000,000 spectators in the United States, during the 1938-39 season, with the professional teams basking in the limelight on the glossy ice of the big rinks. Hockey is now the most important feature of the winter program of Madison Square Garden, New York. The National Hockey League played its seven-team schedule to an average attendance of 10,000 persons a game.

The premier trophy of 1939 in the world of professional hockey—the Stanley Cup—went to the world's championship team, the Boston Bruins, in the National Hockey League (the major league) by defeating the New York Rangers. In the minor leagues: the Philadelphia Ramblers won in the eastern division, and the Hershey team in the western division of the International League; the St. Louis Flyers stand first in the American Hockey Association, and the Portland team led in the Pacific Coast Hockey League.

The Cleveland American Legion team defeated the Minnesota Gophers for the National A.A.U. ice hockey championship. Among leading amateur teams playing the eastern circuits, the New York Rovers led in the Eastern Amateur Hockey League and also defeated the strong Holzbaugh Fords of Detroit in a post-season series for the championship of the United States Amateur Hockey Association, a newly organized outlaw amateur group. The Jamaica Hawks were the victors in the Metropolitan Hockey League.

McGill university blanketed the field in the International Intercollegiate Ice Hockey League. Dartmouth, for the second year in a row, won the Quadrangular League title from Harvard, Princeton and Yale. The crown of the Private Schools Hockey League went to the fast team of St. Francis Prep school, of Brooklyn, and the championship title of the Public Schools Athletic League of New York city was won by the Brooklyn Technical High school.

Abroad.—One of the few recorded hockey championship contests on foreign soil took Europeans by surprise when a team of Canadian skaters, known as the Trail (B.C.) Smoke Eaters, won the world amateur championship crown by defeating a United States team, at Basle, Switzerland. In Canadian amateur hockey, honours were divided between the East and the West. The Port Arthur Bear Cats captured the Allen Cup, symbolic of the amateur championship of Canada in the senior tournament, while the Oshawa Generals won the Memorial Cup in the junior competition. (J. B. P.)

Iceland, area 39,709 sq.mi.; pop. (1938) 118,888; capital town: Reykjavik (pop. 1938, 37,366). Ruler: King Christian X of Denmark and Iceland; language: Icelandic; religion: Christian (Lutheran).

History.—The result of the sea fisheries in 1939 was under normal. As one of the countries which have the largest foreign trade per capita, Iceland has had great difficulty in recent years in marketing her products as a result of import restrictions. Consequently she has had to establish strict control over her own imports and the transfer of foreign exchange. In April 1939 the Icelandic króna was devalued by 22%, and the rate of the pound, which had been maintained at 22.15 kr. for over 10 years, was accordingly raised to 27.00 krónur. A law of Sept. 18, 1939, provides, however, that when the rate of the pound expressed in dollars falls below 4.15, the value of the króna shall be adjusted to the dollar instead of the pound.

Shortly after the devaluation of the currency, the Government formed by the Progressive Peasants party was succeeded by a National Government under the former premier, Hermann Jónasson, with the support of all parties except the Communists.

Work on new roads progressed, so that most of the coastal towns can now be reached by car from Reykjavik, and the construction

of a heating plant whereby all the houses in the capital are to be heated with water from hot springs nearby was inaugurated.

Education.—Compulsory, 1 university and a number of secondary schools.

Banking and Finance.—In 1938, revenue 10,308,000 krónur; expenditure 17,587,000 krónur; notes in circulation (Oct. 1939) 13,785,000 krónur; gold reserve (Oct. 1939) 2,799,000 krónur; currency (Dec. 15, 1939) 25.75 krónur=£1 sterling.

Trade and Communication.—Overseas trade, 1938: imports 49,102 krónur; exports 57,752 krónur. Communications: roads, main 4,800 kilometres.

Agriculture.—Export production in 1938: (in metric tons) klip-fish and uncured salted fish, 43,661; herring, cured (barrels) 326,753; whitefish 15,663; codliver oil and herring oil 28,976; herring meal and fish meal 22,234; mutton, frozen 2,433; wool 577; sheep-skins (export) (number) 453,224; total production: hay 209,410; potatoes 2,317; sheep (head) 591,948; cattle 36,696; horses 49,018; poultry 86,092.

Ice Skating. About 100 carnivals were staged in 1939, thereby developing what was once an exclusive amateur hobby into a big industry within a few years.

The national figure skating championships were held in St. Paul, Minn., for the first time. The national titles were won by the 1938 titleholders, Robin Lee, and Miss Joan Tozzer, both of Minneapolis. Miss Tozzer and Bernard Fox won the national pairs title, and the national dance crown was won by Miss Sandy MacDonald and Harold Hartshorn, of New York. Lee has since become a professional.

National speed honours went to skaters of the Mid-West. The new champion is Ken Bartholomew, of Minneapolis, who won over several veterans. The women's speed title went to Miss Madeline Horn, of Beaver Dam, Wis. The North American title events were held at Lake Placid, the men's title going to Charles Leighton, also of Minneapolis, and Miss Horn also captured the women's crown. A large field of skaters competed in the Middle Atlantic, the East's leading speed event, at Newburgh, N.Y., the home of speed skating in the U.S. Eddie Schroeder, of Chicago, the Olympic skater, took the title, and Miss Helen Bahil, of New York won the women's championship race.

Abroad.—Miss Megan Taylor, of England, won the world's speed skating championship for women, and the men's title went to Graham Sharp, also of England. Felix Kaspar, who was in Australia and did not defend his title, has since turned professional. Canadians dominated the North American championships, in Toronto. Miss Mary Rose Thacker, of Winnipeg, annexed the women's crown, and Monty Wilson, of Toronto, men's North American singles champion since 1929, again emerged the victor. (J. B. P.)

Idaho, is one of the far North-western States in the Union belonging to the group regionally designated as the Pacific North-west. The State's area is 83,880 sq.mi.; population, according to the U.S. census of 1930, 445,032; estimated Jan. 1, 1940, 500,000; capital Boise, 21,544, and the largest city. Cities of more than 5,000 are Pocatello, Idaho Falls, Lewiston, Twin Falls, Coeur d'Alene and Nampa. Idaho is a rural commonwealth. Of the State's population only 129,507, or 29.1%, are urban, according to the 1930 census. There are 437,562 whites, of whom 407,108 were native-born and 30,454 foreign-born. There were 3,638 Indians. In literacy the State was third (98.9%) in national rank, and fourth in the preponderance of native-born (91.5%).

History.—At the biennial election, Nov. 8, 1938, a Republican governor and legislature were elected. Since 1932, the State has had Democratic governors and since 1934 all governmental

branches have been Democratic. D. Worth Clark, a Democrat, was elected United States Senator; Henry Dworshak, a Republican, was elected Representative to Congress from the second district. Compton I. White, a Democrat, was re-elected Representative from the first district. State officials at the close of 1939 were: governor, C. A. Bottolfson; lieutenant-governor, Donald S. Whitehead; secretary of State, George H. Curtis; attorney-general J. W. Taylor; chief justice, James F. Ailshie; State treasurer, Myrtle Enking; State auditor, Calvin E. Wright; State mining inspector, Arthur Campbell.

The 25th legislature, which convened Jan. 2, 1939, and adjourned March 2, enacted 270 laws. Important statutes were those providing for the establishment of civil service tenure through civil service commissions for certain non-elective State employees; an automobile drivers' financial responsibility law; humanitarian occupational disease measures; reduction of passenger automobile licence costs to a flat \$5 fee, a step which reduces owners' operating costs, the loss of revenue to highway districts being compensated for by a diversion of revenues from the State Highway department; an appropriation of \$1,000,000 for the equalization of educational opportunity between "rich" and "poor" school districts, and a law permitting creation of locally-financed Junior College districts.

Education.—The school population during 1939 was 145,262. Of this number 122,952 attended public schools. There were 88,371 pupils and 3,129 teachers in 1,160 elementary schools. The high school enrolment was large; 34,581 pupils and 1,407 teachers in 186 schools.

Banking and Finance.—On June 30, 1939 there were 35 national and 48 State banks with a capital of \$5,102,200, deposits \$91,711,757.78, and total resources \$103,720,669.86. State Treasurer's receipts from Sept. 30, 1938 to Dec. 31, 1939 were \$35,347,149.74 and expenditures \$36,822,509.86, which with previous balances, left \$4,107,871.56 in the treasury. The State's assessed valuation was less than \$400,000,000. On April 1, 1939, the bonded debt was \$1,419,500, as compared with \$1,378,500 a year previously. The State entered 1940 in sound financial condition.

Agriculture, Manufactures, Mineral Production.—Most recent statistics (1935) reveal 45,113 farms valued at \$307,395,329, with an annual livestock and crop production income of \$120,000,000. The three leading crops in 1939 in dollar values were 22,624,000bu. of wheat, \$13,348,000; 2,196,000 tons of tame hay, \$14,494,000; and 29,670,000bu. of potatoes, \$11,275,000. Although Idaho's three major industries are agriculture, mining, and forestry, manufacturing is attaining increasing importance. Manufactured products reached, in 1935, a total of \$67,549,960. There were 459 manufacturing establishments, employing 10,537 wage workers, earning annually \$11,985,026. Eleven manufactures were producing outputs each in excess of \$1,000,000. The five largest in rank order were: lumber (\$19,326,216), smelting and mining lead (about \$10,000,000), butter (\$9,582,927), beet sugar (about \$5,000,000), and flour with grain mill products (\$4,288,941).

In 1939, Idaho's "big five" metals: silver, lead, zinc, copper, and gold, produced \$30,166,000 as compared to \$38,316,400 in 1937. In dollar values silver was first, with 17,199,600 oz. worth \$11,674,880 in 1939. Output and value of the others were: 181,400,000lb. of lead, valued at \$9,070,000; 93,150,000lb. of zinc, \$4,936,950; 114,000 oz. of gold, \$3,990,000; and 4,750,000lb. copper, \$494,000. Since the discovery of gold in 1860, Idaho mines have produced a huge metal output, valued at \$1,330,166,000. (Co. J. B.)

Illinois, a north central State of the United States, admitted to the Union in 1818, has a population of 7,630,654 (1930

census) of which 1,242,447 are foreign born, 328,972 Negro. Estimated population, July 1, 1937, 7,878,000. Area, 56,043 square miles. Capital, Springfield, population 71,864. Four cities in the State are larger: Chicago (3,376,438); Peoria (104,969); Rockford (85,864); E. St. Louis (74,347).

History.—State officers elected in 1936 were Henry Horner, governor; John Stelle, lieutenant-governor; Edward J. Hughes, secretary of State; Edward J. Barrett, auditor of public accounts; Otto J. Kerner, attorney general, all Democrats.

Ill health kept Governor Horner out of the State, Nov. 1938 to April 1939, and away from Springfield some time longer. Lieutenant-Governor Stelle, designated by the constitution as acting governor, associated with himself in the discharge of his duties two of the Governor's department heads and close friends, Charles H. Nudelman and James M. Slattey. Senator James Hamilton Lewis died April 9. Mr. Slattey, pending the Nov. 1940 election, was appointed to succeed him. Grace Abbott, internationally known in work for women, and Cardinal Mundelein, Archbishop of Chicago, died during the year.

With the Lower House of the General Assembly Republican, little constructive legislation was passed in the regular session. An act making women eligible for jury duty was passed. Bills limiting the power of the Parole Board and reapportioning the State to remove the discrimination against Chicago failed of passage. A bill increasing the State's contribution to old-age pensions was vetoed by the Governor. A special session to re-enact the State law was expected. Bills introduced by Senator Hickman repealing some 400 obsolete laws were passed. Biennial appropriations, reduced by the Governor's veto, totalled \$478,000,000 against an estimated revenue of \$456,000,000. State contribution for relief in the biennium was set at the compromise figure of \$96,000,000 which will have to be increased before the biennium's end.

Education.—Public instruction in Illinois is supervised by the State Superintendent of Public Instruction, elected for four years in the off-year election. For the year ending June 30, 1937, the enrolment (elementary and secondary schools) was 1,302,662, with a teaching staff of 47,819. School buildings numbered 13,934. Schools are supported by local taxation and a State distributive fund and are administered by some 12,000 school boards.

Of the State's higher institutions of learning, the University of Illinois had an enrolment in the fall of 1939 of 13,894, 1,220 of whom were in the Chicago departments. The five State normal schools reported a total enrolment of 7,852.

Public Welfare.—Twenty-seven State institutions with approximately 50,000 inmates are operated by the State Department of Public Welfare. Other duties include administration of services provided by the Social Security Act—old age assistance, child welfare, aid to handicapped children—for which new divisions have been formed. Co-operative measures providing aid for the blind and for dependent children have not yet been taken in Illinois.

Appropriations for the 1939-41 biennium total \$34,564,342 besides funds for continuing an extensive building program which the State has pursued in co-operation with the PWA. Illinois leads all States in the proportion of population receiving old-age pensions. In September 135,721 recipients received average monthly payments of \$19.61.

There were repeated escapes of inmates in the unwallled St. Charles School for Boys. The Public Welfare department hesitated long before using a legislative appropriation for a fence. An additional appropriation was made for an "Illinois Training School for Boys" intended for older and more hardened boys. An epidemic of typhoid at the Manteno State hospital resulted up to October 17 in 48 deaths and 386 patients. Indictments were voted against the Director of Public Welfare and three officers of the institution for alleged negligence.

Despite proposals to consolidate all public assistance activities in one department, the Illinois Emergency Relief Commission is now entering its ninth year. In July it required all clients on its rolls to re-apply. In September 1,043,645 persons in Illinois, 13.7% of the 1930 population, were dependent on the five public assistance programs, general relief, WPA, old-age assistance, mother's pensions and blind pensions. There were 125,190 persons employed in WPA projects as compared with 246,386 in Sept. 1938. Total expenditures for direct relief for the month were \$4,781,499.56 of which \$3,880,971.67 came from State funds.

Finance.—For the first 10 months of 1939 the State's revenue receipts were as follows: direct property tax (arrears, no tax levied since 1932), \$287,904.56; inheritances \$3,358,788.61; liquor taxes, \$9,273,471.34; insurance fees and taxes, \$7,091,137.14; corporation fees and taxes, \$3,320,190.49; interest on State funds, \$100,333.01; sales tax, \$71,220,596.45; public utility tax, \$7,799,084.15; motor fuel tax, \$34,829,191.86; motor vehicle tax, \$20,234,760.58; Illinois Central railroad, \$953,633.75; miscellaneous, \$7,499,464.71. Subventions from the Federal Government, and trust funds are not included. State bonded indebtedness included \$121,140,000 State highway bonds, \$16,956,000 soldiers' compensation bonds, \$1,000,000 waterway bonds, \$11,502,000 emergency relief bonds of 1932, \$26,500,000 emergency relief bonds of 1934.

Industry.—Reports from 6,752 manufacturing and non-manufacturing establishments employing 640,645 persons at a weekly payroll of \$17,701,302 in Oct. 1939 indicated a contraseasonal increase over Sept. 1939 of 3.6% in employment and of 7.3% in payrolls. Increases for Oct. 1939 over Oct. 1938 were respectively 10.8% and 17.7%; decreases for Oct. 1939 from Oct. 1937 were -8.0% and -6.1%. The 4,634 establishments reporting by sex in Oct. 1939 reported 356,795 males with a weekly payroll of \$11,005,989, and 100,207 females with a payroll of \$1,676,883.

Oil.—The oil industry continues its spectacular advance. By September daily production had reached a peak of 331,416 barrels. At present there are some 30 fields in 18 Illinois counties, with 3,000 wells in the fields discovered since Jan. 1, 1937. In the Salem-Lake Centralia pool, the richest of the fields, 1,200 wells have been drilled in little more than a year. The Fayette county, and the Central Basin in Clay, Richland, and Wayne counties are second and third. Illinois is now fourth among oil producing States, yielding about one-tenth the nation's production. In alleged protest against her uncontrolled production, and consequent price cutting, six States shut down their production in the late summer. Legislation regulating the industry by spacing wells and pro-rating product, as well as levying a tax on the new-found wealth of \$40,000 a day in royalties, has been earnestly advocated but so far remains unenacted.

Agriculture.—In the face of a crop decline in the United States of 3 to 4%, Illinois enjoyed a bounteous yield for the year. Estimated average corn yields of 51.5bu. per acre and soybean yields of 24bu. per acre set an all-time record. Previous high yields had been for corn 48bu. in 1937 and 23.5bu. for soybeans in 1938. Use of new hybrid strains of corn is partially responsible for the increase. The State's corn crop from 8,093,000ac. is expected to be 416,790,000 bushels. The fruit crop is well above the 10-year record, the apple crop being estimated at 4,700,000bu., much of it, however, of low quality. (T. C. PE.)

Illinois, University of, in the academic year 1938-39 reached a new all-time mark in enrolment, and began extensive new building construction on the campus. In the completed 1938-39 academic year, including extension courses and the 1938 summer session, the total of individuals enrolled was 17,500. The 1939 summer session set a new record with 3,894 students.

In November, 13,894 students enrolled for the first semester of 1939-40. Of these, 12,290 were on the campus at Urbana-Champaign, 1,220 on the campus at Chicago, and 384 in extra-mural courses. Of the enrolment, 1,458 were graduate students, these numbering 1,285 in the Graduate school at Urbana-Champaign and 173 in graduate work of the colleges of medicine and dentistry at Chicago.

In 1939 a total of 3,516 degrees were conferred. This included 2,562 bachelors, 635 masters, 112 doctors of philosophy, 159 doctors of medicine, 40 doctors of dental surgery, and 8 professional engineering degrees. For 1939-40, the total staff at Urbana and at Chicago numbered 2,687. Of this total, 56 persons were listed as solely administrators, 1,718 teaching staff, 178 research workers, 96 as librarians, 61 extension staff, 508 miscellaneous.

The operating budget for 1939-40 is \$8,532,397. This included \$5,432,500 from tax revenues through the biennial State appropriation plus income from other sources. About 13% of the operating budget funds will be expended for organized research.

The library is fifth in size among all American universities and largest of any State university. It contains 1,117,000 volumes, 330,000 pamphlets, 3,900 maps, and 10,600 pieces of sheet music. More than 30,000 volumes are added each year, by gift and purchase. Total value of the university's physical plant at June 30, 1939, was \$31,891,981. This includes 2,318 ac. of land—414 ac. comprising the main campus at Urbana-Champaign, 3 ac. the campus at Chicago, and balance in agricultural experiment farms; 77 major and 58 other buildings; improvements; equipment; and library.

As 1939 ended, new buildings under construction and being planned on the Urbana-Champaign campus totalled \$5,595,000 in value.

Illiteracy. During 1939, because of wars and upheavals over wide areas of the globe, there was a net loss in the world's efforts to reduce illiteracy and in similar movements toward popular education. Germany, which before the World War (1914-18) had established a high record in all forms of education, has lost ground during recent years because of concentration on military enterprises which culminated in 1939 in the European war. Czechoslovakia, with one of the highest literacy rates in the world, suffered great injuries to her school system because of the debacle of 1938 and the German conquest of 1939. China, with the greatest number of illiterates of any nation in the world, has been compelled because of the Japanese invasion to abandon her recent effective efforts to teach the masses to read through a simplified "alphabet" of 1,000 characters. Reports from the Union of Soviet Socialist Republics, where recent mass education had reduced illiteracy from the 75% of 1895 to less than 30% in 1937, indicate a slowing down in educational programs. Italy, Spain and all the countries of eastern and southern Europe have been too busy with wars and the threats of war to make any concerted national efforts toward popular education and national literacy. India and Egypt still report illiteracy of over 80% of the population. Mexico and other Latin American nations are making heroic efforts to improve the education of their people but illiteracy in all these countries is still exceedingly high. In Mexico nearly 60% of the population over ten years of age is still unable to read or write.

The United States of America was one of the few countries to continue to make progress in the reduction of illiteracy during the year 1939. A nation-wide effort to teach the whole nation to read and write continued to be the chief item in the vigorous program in adult education of the Works Progress Administration. In 1930—the last year for which comprehensive figures are available—the United States possessed 4,283,753 illiterates over ten

years of age, or 4.3% of the population of that age. The best record (only .6% illiterates) was shown by whites of foreign or mixed parentage, native whites having 1.8% illiterates, foreign born whites having 9.9% and Negroes 16.3%. Rates in given States, according to the 1930 census, ranged from Iowa with only 0.8% of its population illiterate to South Carolina with 14.9%. While Negroes still show the highest illiteracy of any large group of the American population, they have made the greatest recent progress. At the time of emancipation in 1863 it was estimated that of the 4,500,000 slaves and "free persons of colour" in the United States less than 5% could read and write; in 1939 the 12,000,000 American Negroes have a literacy rate above 85%. The Works Progress Administration reports that during the past six years of intensive effort it has taught 1,300,000 people to read and write. This should bring the illiteracy in the U.S. by the next decennial census to about 3% of the population over ten years of age, by far the best record the nation has shown at any time in its history. (E. R. E.)

Illumination: see ELECTRIC LIGHTING.

I.L.O.: see INTERNATIONAL LABOUR ORGANIZATION.

Immigration. The principal laws in the United States relating to immigration are the act of Feb. 5, 1917, generally referred to as the basic immigration law, and the act of May 26, 1924, known as the quota act. The act of 1917 provides for the exclusion and deportation from the United States of aliens because of their mental, physical, economic or social unsuitability. The act of 1924 places a limitation on the number of aliens who may enter the United States annually for permanent residence.

Numerical restrictions are not placed upon natives of Canada, Newfoundland, the Canal Zone, or independent countries of the Western Hemisphere; and such restrictions do not apply to the wives and unmarried minor children of citizens, or to the husbands of citizens where marriage occurred prior to July 1, 1932. The administration of all laws relating to immigration is under the supervision of the Commissioner of Immigration and Naturalization at Washington, D.C.

In the fiscal year ended June 30, 1939, 82,998 immigrant and 185,333 non-immigrant aliens were admitted, while 26,651 emigrant and 174,758 non-emigrant aliens departed from the United States. Of the "immigrant" class, 63,138 were from European countries, 17,139 were from the Americas, and 2,721 were from Asiatic and other sources. Included in this class were 1,088 husbands, 3,759 wives, and 2,196 minor children of American citizens. Under the "non-immigrant" classification 42,267 aliens were admitted as returning residents.

During the same period 6,498 aliens were debarred from admission at ports of entry, and 8,202 aliens, including 1,638 criminals, were deported from the country. As distinguished from deportation, 1,825 indigent aliens were repatriated at their own request, and 392 Filipinos were returned to the Philippine islands.

Immigration officers boarded 33,836 vessels and inspected crews totalling 971,662 alien and 416,124 American citizen seamen. Because of discharges, hospitalization, or desertion 19,918 alien seamen did not leave with the vessels on which they arrived. However, 17,252 alien seamen shipped out of American ports during the year, leaving an excess of arrivals over departures of only 2,666. (See also REFUGEES.) (J. L. Ho.)

Immunization, Therapeutic: see SERUM THERAPY.

Imports: see EXPORTS AND IMPORTS; INTERNATIONAL TRADE.

Income Tax. Changes made in the Federal income tax law in 1939 were designed in large part to remove tax

deterrents to business initiative. They concerned primarily the taxes payable by corporations, although some significant changes were made also in the tax on the incomes of individuals.

Federal income tax collections in the fiscal year ended June 30, 1939, amounted to \$2,151,375,000 or 39.1% of the total Federal internal revenue and customs. The individual and corporate income taxes contributed \$1,028,834,000 and \$1,122,541,000, respectively, to this total. Excess-profits tax collections, not included in the above totals, amounted to \$27,056,000.

State income tax collections in 1938 are estimated to have been \$437,000,000 (\$249,000,000 from individuals and \$188,000,000 from corporations) or 11.3% of estimated State tax revenues.

Tax on Individuals.—The Federal Government's individual income tax consists of a 4% normal tax and a surtax ranging from 4% to 75%, applicable to incomes over \$4,000 after allowance for exemptions and credits. The personal exemptions allowed for both normal and surtax purposes are at present \$1,000 for a single person, \$2,500 for married persons and \$400 for dependents. The earned income credit, applicable against the normal tax, is at a rate of 10%, allowable only on amounts of earned income not in excess of \$14,000, with \$3,000 of income considered earned whether or not actually earned. These provisions serve to exempt from Federal income taxes single individuals with net incomes of \$1,111 or less and married persons with net incomes of \$2,778 or less, if without dependents.

Federal income tax data for 1937, compiled from income tax returns filed in 1938, show that in that year 3,371,443 individuals were liable for Federal income taxes. This exceeded the corresponding number for the preceding year by 510,335 or 17.8%. These data reveal further that 58.5% of the total net income reported by individuals was received by persons having less than \$5,000 and 92.1% by persons having less than \$50,000 net income each. On the other hand, due to the operation of the exemptions and the progressive surtax rates, persons with less than \$5,000 net income paid 6.3% and those with less than \$50,000 net income paid 44.8% of the total individual income tax collections.

Individual income is taxed also by 31 States and the District of Columbia. In all but three of these the rates are progressive, the minimum rates ranging from 1% to 3%, and the maximum rates from 3% to 15%. Four additional States tax particular sources of income at flat rates. Six States in the above two groups impose also surtaxes.

In no instance, however, does the maximum State income tax

rate, including both normal and surtax, exceed 15%. In some instances, State income taxation is directed toward the low income groups, as is evidenced by the fact that the personal exemptions are below the Federal level in 12 States for single persons, in 21 States for married persons, and in 23 States for dependents. Although some States preceded the Federal Government in employing the income tax, more than half the States now imposing it adopted it in 1929 or thereafter.

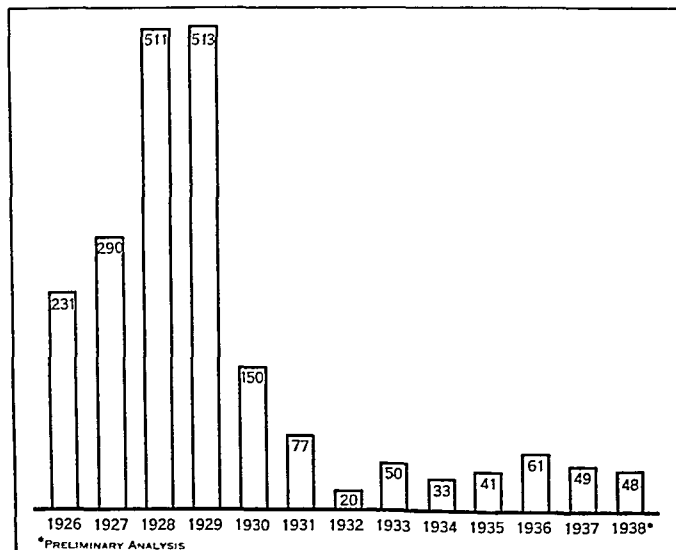
Two important changes affecting the individual income tax were made during 1939. The first of these was effected by the Public Salary Tax Act of 1939, which subjects to the Federal income tax for taxable years beginning after Dec. 31, 1938, the compensation of all State and local officers and employees, as well as the compensation of judges of courts of the United States who took office on or before June 6, 1932, and consents to the non-discriminatory taxation of the compensation of Federal officers and employees received after Dec. 31, 1938 by State and local Governments. In general, prior to the enactment of this legislation the Federal income tax applied to the compensation of Federal employees but did not apply to the compensation of State and local employees. States with income taxes, on the other hand, usually taxed the salaries of State and local employees but did not tax the compensation of Federal employees.

In pursuance of the Public Salary Tax Act, 16 States and the District of Columbia passed legislation in 1939 providing for the taxation of the compensation of Federal employees. A number of additional States can tax the salaries of Federal employees without special legislation.

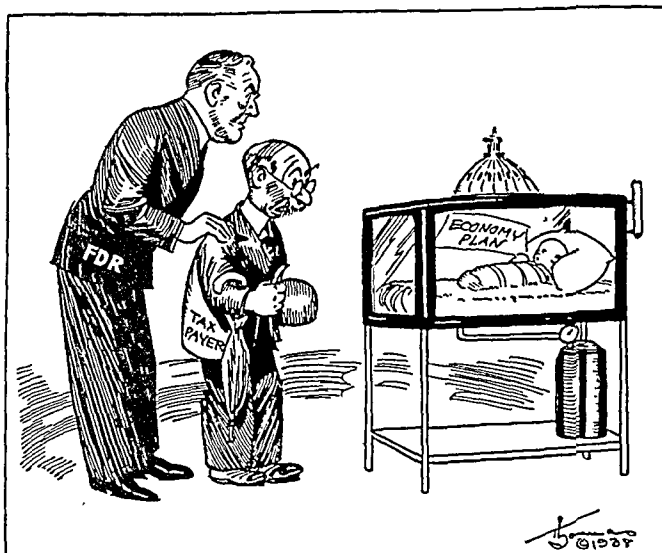
Another income tax change during 1939 was the provision in the Revenue Act of 1939 for a net operating business loss carry-over for a period of two years applicable to individuals, members of a partnership, estates and trusts, and participants in a common trust fund, as well as to corporations. This provision takes effect with respect to taxable years beginning after Dec. 31, 1939 but a net operating loss may be carried over from a year beginning on or after Jan. 1, 1939.

Corporation Income Tax.—The Revenue Act of 1939 imposes a flat rate of 18% upon corporations with net incomes of more than \$25,000. This change, applicable to taxable years beginning after Dec. 31, 1939, in effect removes the last remnant of the undistributed profits tax, which, under the 1938 Act, had been retained for corporations with net incomes of more than \$25,000 but reduced to a maximum of 2½%. Corporations with net incomes of \$25,000 or less are subject to rates graduated from 12½% of their net income not in excess of \$5,000 to 16% of such income in excess of \$20,000. In the case of corporations with net incomes of slightly over \$25,000, the law provides for an alternative tax which is designed to accomplish a gradual transition between the tax on corporations with net incomes of \$25,000 and less and the tax on those with net incomes in excess of that amount. With reference to the above size classification, it should be noted that whereas under the 1938 Act it was based upon net income, under the 1939 Act it is based upon net income less credits for (1) interest on certain obligations of the United States and Government corporations and (2) dividends received.

Banks, insurance companies, China Trade Act corporations and domestic corporations deriving a large portion of their gross income from sources within the United States, which were subject to a flat rate of 16½% under the 1938 Act, are taxed under the 1939 Act at the same rates as other corporations, that is, distinction is made between those with net incomes of \$25,000 or less and those with net incomes of more than \$25,000. The rate applicable to resident foreign corporations is decreased by the 1939 Act from 19% to 18% and the rate on mutual investment companies is increased from 16½% to 18%.



NUMBER OF INDIVIDUAL NET INCOMES of \$1,000,000 or more in the United States in calendar years indicated



"A VERY DELICATE CHILD" was the Administration's economy plan of 1939, according to Thomas of *The Detroit News*

Federal income tax statistics show that 529,097 corporations filed income tax returns for 1937, of which 192,028 reported net incomes and 285,810 reported deficits. The remaining 51,259 corporations were inactive during the year. The aggregate net income of the corporations reporting net incomes was \$9,634,837,000; the total deficit of the corporations with no net income was \$2,280,846,000.

The classification of corporations by the size of their net incomes is not yet available for 1937. In the preceding year, 1936, only 13.7% of the total net income corporations reported net incomes in excess of \$25,000. The corporations in this group, however, accounted for approximately 93% of the total net income and paid approximately 93% of the total tax.

General corporation income taxes are also levied by 32 States and the District of Columbia. One additional State restricts its corporate tax to income from intangibles. Six States impose graduated rates, the minimum rates ranging from 1% to 3% and the maximum rates from 5% to 8%. The other 27 States and the District of Columbia impose flat rates, ranging from 1½% to 8%. Rates of 2%, 4% or 6% are most frequent.

The Revenue Act of 1939 made significant changes in the Federal corporation income tax with respect to (1) the carry-over of net operating business losses, (2) the treatment of corporate capital losses, and (3) the treatment of income resulting from the discharge of corporate indebtedness.

The provision regarding the carry-over of net operating business losses for individual income tax purposes, discussed above, applies also to corporations. However, the privilege of carrying over losses is denied to personal holding companies, mutual investment companies and (for purposes of the surtax) to corporations subject to the surtax on improper accumulation of surpluses.

Under the Revenue Acts of 1934-38, corporations were allowed to deduct capital losses only to the extent of \$2,000 plus capital gains. The Revenue Act of 1939 allows to corporations, other than domestic and foreign personal holding companies, full deduction of losses on capital assets held for more than 18 months against ordinary net income for the taxable year in which the loss was realized. Losses of corporations on capital assets held 18 months or less, so-called short-term capital losses, are allowed only to the extent of short-term gains, but losses disallowed in one year (to an amount not exceeding net income) may be carried forward and applied against gains from such transactions in the succeeding taxable year. This corresponds to the treatment

of the short-term capital losses of individuals provided by the Revenue Act of 1938. Short and long-term gains are treated the same as other income.

The Revenue Act of 1939 liberalized the treatment of income resulting from the purchase of bonds at less than their face value in the case of debt-ridden corporations. A corporation which establishes to the satisfaction of the Commissioner that it is in unsound financial condition may redeem its bonds, notes, or other evidences of indebtedness in existence on June 1, 1939 at less than face value without recognition of gain if such redemption occurs after the enactment of the 1939 Act, June 29, 1939, and in a taxable year beginning prior to Jan. 1, 1943.

Finally, mention should be made of the provision of the Revenue Act of 1939 authorizing corporations to increase their capital stock valuations for the fiscal years ending June 30, 1939 and June 30, 1940. The Revenue Act of 1938 had previously authorized the revaluation of capital stock in 1938 and every third year thereafter. This provision affects also the excess-profits tax since the valuation adopted for capital stock tax purposes determines also the liability under the excess-profits tax. (See also LEGISLATION, FEDERAL: *The Revenue Act of 1939.*) (R. BL.)

United Kingdom.—Owing to the war the income tax position in the United Kingdom for the year 1939-40 was affected by the introduction of a second budget. Under the Finance Act, 1939, the income tax rate was maintained at 5s.6d. in the £. The rates of surtax, however, on income exceeding £2,000, as fixed by the Finance Act 1931—ranging from 1s. in the £1 to 7s.6d. in the £ on the excess, and subsequently increased by 10%—were now raised by 15% on the first £6,000 of the excess, and by 20% on the balance. The provisions against the evasion of surtax were further strengthened.

The Finance (No. 2.) Act, 1939 raised the income tax rate for the last three-quarters of the year 1939-40 to 7s.6d. in the £, making an average rate of 7s. in the £ for the full year. The surtax on incomes over £2,000 was raised to rates ranging from 1s.3d. in the £ to 9s.6d. in the £ on any excess over £30,000. In addition, provision was made for the reduction of certain allowances for the year 1940-41, such as the personal and child allowances and the earned income, reduced rate and age reliefs.

(H. E. A. C.)

India, area 1,575,187 sq.mi. of which the native states and agencies total 712,508 sq.mi.; pop. (est. 1938) 362,828,000. Chief towns (pop. census 1931): Calcutta (1,485,582); Bombay (1,161,382); Madras (647,230); Hyderabad (466,894); Delhi (cap. 447,442); Lahore (429,747). Ruler, George VI, Emperor; viceroy, the marquess of Linlithgow; languages, Hindi, Bengali and Urdu the most important; religions, Hinduism (approx. two-thirds), Mohammedan (approx. one-fifth).

History.—Cross-currents, not wholly dissociated from personal rivalries, kept the Congress party busy during the early part of 1939. In January the retiring president, S. C. Bose, came forward for re-election; but a nominee of Mahatma Gandhi was put up to oppose him. Mr. Bose won; whereupon Gandhi, while ostensibly accepting the verdict, turned at once to another field of activity. A trivial dispute with the chief of Rajkot was developed until Gandhi decided to "fast until death" over a question, as it has been described, of "whether the ruler of a state of less importance than the Isle of Wight has interpreted correctly the wording of an ambiguous letter relating to the composition of a committee." By the time that the viceroy had intervened and the chief justice of the federal court had given a lengthy opinion on the issue, Gandhi had the eyes of the world upon him, and consented to break his fast. Returning to the Congress, his renewed prestige enabled him to enforce Mr. Bose's retirement and replacement as president by

one of his own disciples, Dr. Rajendra Prasad of Bihar. Mr. Bose, whose following is mostly in Bengal, remains in the Congress as head of an extreme Left group, loosely allied with the communist affinities of Pandit J. L. Nehru; and the official temper of the Congress changes from ultimatum to bargaining.

The ultimatum had issued in February, when the Congress intimated to the Government that, within six months, a categorical answer must be given to its demand for self-determination; otherwise the demand would be made effective by the help of a national volunteer corps a million strong. The threat was ignored; in September the position had changed, and the weapon of bargaining was brought into operation. In the interval the Congress was hard at work attacking the preparations for federation. This, which is to be the culminating feature of the new constitution, has been awaiting the consent of the princes, whose adhesion to the federal scheme must be purely voluntary; but the Congress has always opposed it, and is consequently extending its activities from the British provinces into the states. Its method is a war of nerves upon the princes. An association is set up or emissaries engaged in a state, grievances against its ruler are sought out and magnified, and an agitation started for reform and representative institutions. In some of the larger states, drastic action has been taken against this interference; the Nizam of Hyderabad issued a firman in February, calling on his subjects to prevent harmonious development from being hampered by "poisonous influences from outside." Smaller states like Rajkot have been unable to resist the pressure, and at the same time cannot afford the changes which are demanded. Bitterly though it is resented in the states, the intervention of the Congress has put a decided brake on the movement toward federation.

Federation.—The argument of the Congress in fighting the federal scheme is that the representatives of the states in the Federal Government and legislature, being nominees of their rulers, will bring an autocratic and reactionary force into the central administration, and play into the hands of British imperialism. Gandhi leaves the point in no ambiguity; there can, he says, be "no halfway house between total extinction of the states, and the princes making their people responsible for the administration of their states." With this choice before them, it is not surprising that the more conservative rulers should hesitate to submit to a partnership in which, on the side of British India, the Congress influence would be dominant. The more progressive princes are equally reluctant, though on different grounds; why, they ask themselves, should they risk their treaty rights, if the paramount power in India is going to abdicate in favour of the revolutionary followers of Gandhi? This somewhat tenuous apprehension is a symptom of the cooling of the earlier enthusiasm which the princes displayed for the Federal idea at the Round Table conferences. When the hard administrative details come to be faced, the rulers find themselves required to surrender ancient powers and privileges inherent in their order. They have thus been hanging back from consent to the Instruments of Accession which have to be executed as the condition of admission into the federal structure.

After infinite suasion and negotiation, final drafts of those instruments were communicated to the princes in Jan. 1939, for acceptance or otherwise by September 1. At a conference of princes held at Bombay in June, the proposals were rejected as "fundamentally unsatisfactory" by states representing 71% of the total state population. This decision does not exhaust the obstacles to the project; the very stars in their courses seem to be fighting against it, despite the strenuous endeavours of Lord Linlithgow to get it completed during his viceroyalty. Not the least serious opposition comes from the Indian Muslims, who deprecate the principle of federation on the ground that it will

increase the Hindu power in the Central Government. The more fiery spirits in the Muslim camp indeed are aflame with a vision of exchanges of population which will enable a great Islamic state to be established in and around the Punjab, a state which will link up with the string of Islamic powers from Kabul to Istanbul. The prospects of an early federation are thus obscure; and yet all parties are agreed that there can be no national future for India until the provinces and the states are knit together in political unity.

India and the War.—Immediately on the entry of Great Britain into war (September 3), the viceroy broadcasted an appeal to all parties and sections in India for co-operation. The first response to come from a political organization was on September 10 from the National Liberal Federation, with a declaration that "India should unhesitatingly and ungrudgingly support the democratic powers." On September 15 the working committee of the Congress issued a lengthy statement, condemning Naziism but declaring that India cannot associate herself with an imperialistic war. Before taking a decision, however, the committee invited the British Government to announce its war aims in regard to India, which must include the establishment of a full democracy in the country and the right of the Indian people to frame their own constitution through a constituent assembly. On this understanding, the statement continued, India would join "other free nations for mutual defence against aggression and for economic co-operation." The all-India Congress committee met later, endorsed this reply and demanded, without further circumlocution, that "India must be declared an independent nation." On September 18 the Muslim League, with a watchful eye on the tactics of the Congress, urged that no declaration of constitutional advance should be made by the British Government without their consent and approval.

On October 22 the working committee of the Congress met and resolved that Lord Linlithgow's statement was unfortunate and wholly unsatisfactory, and that they were "unable to give any support to Great Britain." As gage of battle, they called upon ministers in the provinces who are adherents of the Congress party to resign, an order which was obeyed, so that eight out of the eleven provinces are now without cabinet Governments, further efforts by the viceroy to ease the tension having failed. The provinces are carrying on comfortably under the personal rule of their governors; but the general situation is that the Congress refuses co-operation in what it admits to be a righteous war and has attempted to make the administration unworkable because Great Britain is not prepared with an immediate declaration of India's independence. In this attitude Congress is not supported by the Muslim League or by a number of not unimportant, though smaller, Hindu political groups; even in orthodox Congress circles the feeling is growing that their case has been overstated, and a prominent organ of their press has recently been repudiating the idea of cutting the British connection. More important still, these declamations have not affected the general public; for the response to India's war effort is already widespread and impressive. Most of the greater princes have placed all their resources at the service of the Government; the martial races are pouring into the recruiting offices; and large quantities of material are on their way to England—tents, boots, sandbags, etc.: of sandbags 500,000,000 had been supplied by the end of November with a promise of another 100,000,000 a month to the end of April, 1940.

Education.—Recognized institutions in British India (excluding Burma): primary (males): schools 160,545, scholars 7,755,656; (females): schools 31,699, scholars 2,468,632; secondary (males): schools 11,731, scholars 2,005,031; (females): schools 1,325, scholars 282,841. Colleges (males): number 306, scholars 110,022; (females): number 40, scholars 6,593. Universities: British India

15, Native States 3.

Defence.—A committee under Lord Chatfield which has been examining the whole question of India's defence, has recommended the complete modernization of its military forces, at a cost of £33,000,000. It is understood that this has been accepted by the British Government, which will make India a gift of three-fourths of that sum.

Banking and Finance.—Although the budget estimates for 1938-39 had been balanced without extra taxation, the actual results reflected the trade depression, and searching economies had to be effected to avoid a deficit. The budget of 1939-40 was balanced without any special severity, other than doubling the import duty on raw cotton, a measure which the finance minister hoped would stimulate India's endeavours to grow a long-staple cotton of its own. A stringent income-tax law was passed during 1939, and ought to improve the future yield from that source. But the orthodox finance of the central Government is in strange contrast with the devices of the provincial ministers for filling their yawning exchequers. Their first demand in every case is for larger grants from the central Government, to be recouped by the reduction of the British garrison. Failing in that quest, some of them favour taxation on callings and professions, with special attention to the salaries of the public servants; and Bombay has an ambitious tax on immovable property, likely to check the recent building activity.

Revenue, central Government (est. 1938-39) Rs. 1,22,28,00,000; expenditure, central Government (est. 1938-39) Rs. 1,22,18,00,000; revenue, central Government (est. 1939-40) Rs. 1,21,82,00,000; expenditure, central Government (est. 1939-40) Rs. 1,21,77,00,000; public debt (March 31, 1939): domestic Rs. 7,36,42,00,000; public debt (March 31, 1939): external Rs. 4,69,14,00,000; notes in circulation (Sept. 1, 1939) Rs. 1,82,13,17,000; gold and sterling reserve (Sept. 1, 1939) Rs. 1,03,91,57,000; currency: 1 rupee (Rs. 1)=1s. 6d. at par; average exchange rate (1938) Rs. 1=17.94 pence.

Trade and Communication.—By Jan. 1, 1940, there were signs of slow recovery from the preceding trade depression, although one important product, sugar, had been hit by unfavourable seasons. The balance of payments was improving, and the rupee exchanges showed no disturbance. With the outbreak of war, a new and abnormal stimulus will have been given to India's chief exports. Taking normal conditions, however, one can see material for anxiety in the economic situation. The nationalist ambition is to convert India from a purveyor of raw products into a great self-sufficient industrial power, the chief instrument of change being a protective tariff. In a sense that instrument has proved effective, as the yield of the protective customs duties is rapidly declining. But its reaction on the general well-being of the people is questionable. Falling imports must weaken the world's demand for India's agricultural produce; and the interests of the peasant will in time clash gravely with those of the politically-minded manufacturer. Some alleviation is being experienced meanwhile in the changing character of India's imports. Many of the old staples show a sharp fall—cotton, textiles, iron and steel, railway equipment, chemicals, soap, rubber. With this, however, the country's requirements are growing in diversity, and the import is rising of machinery, transport vehicles, all sorts of electrical equipment, films, wireless apparatus (there are now more than 70,000 receiving licences as against 55,000 in 1938), as also of certain food-stuffs and drinks.

Overseas trade 1938-39: imports, merchandise Rs. 1,52,32,76,888; exports, merchandise Rs. 1,62,79,16,269; re-exports, merchandise Rs. 6,42,35,626; gold and silver coin and bullion, imports Rs. 2,77,77,737; exports Rs. 14,09,08,106; imports from Afghanistan Rs. 2,48,95,446; exports to Afghanistan Rs. 50,70,332.



DOMINION STATUS FOR INDIA was demanded as a British war objective by Mohandas K. Gandhi, who returned in 1939 to an active political life

Indian Imports and Exports

	Imports from Rs.	Exports to Rs.
U.K.	46,49,10,104	55,51,13,159
Burma	24,34,90,023	10,03,30,903
Japan	15,41,33,050	14,50,02,043
Germany	12,02,72,079	8,55,48,770
U.S.A.	9,77,82,601	13,87,91,101

Roads (1937) British India only, 69,000mi. metalled, 200,000mi. unsurfaced. Railways (1937-38): Mileage open to traffic, 41,076, of which 29,732mi. are Government owned. Shipping, tonnage entered (monthly average 1938), 761,000; tonnage entered (Aug. 1939) 853,000.

Shipping, tonnage cleared (monthly average 1938) 793,000; tonnage cleared (Aug. 1939) 811,000.

Motor vehicles licensed (March 31, 1938): British India 97,872 cars and taxis; 39,172 commercial vehicles; 9,385 motor cycles, including scooters and auto-wheels. Wireless receiving set licences (April 30, 1939) 73,698.

Telephones (March 31, 1938): 71,862 straight-line connections, 463 exchanges.

Agriculture, Manufactures and Mineral Production.—Production: (in metric tons) rice (1938-39) 23,962,100; wheat (1939 est.) 10,086,300; cane sugar, raw (1938-39) 4,156,800; maize (1937-38) 2,155,600; barley (1937-38) 2,123,100; jute (1938) 1,242,000; coal (1938) 28,806,000; iron ore (metal content) (1938) 1,850,000; pig iron and ferro-alloys (1938) 1,576,000; steel (1938) 982,000; petroleum, crude (1938) 317,000; cotton, ginned (1938-39) 929,200; ground-nuts (1938-39) 3,080,500; tobacco (1937-38) 519,300; tea (1937) 195,200; manganese ore (metal content) (1938) 450,000; linseed (1938-39) 464,300; gold (1938) 10,000kg.; bauxite (1937) 15,400; potash (export 1937) 4,000; chrome ore (chromic oxide content) (1937) 31,000; rape seed (1938-39) 932,000; sesamum (1938-39) 401,400. Industry:

cotton (1938-39) yarn spun 1,303,245,902lb.; woven goods 920,-475,805lb.; number of mills 435; average number employed 569,000. Jute (1937): mills 105; average number employed 309,000; total number of factories (1937) 10,647; average daily number employed (1937) 1,957,000. See also EDUCATION: *British Empire*. (ME.; W. H. WN.)

Indiana. Indiana was admitted into the Union Dec. 11, 1816, the day of the year now observed as Indiana Day. Official figures for its area vary somewhat; the topographical survey now in progress may, for the first time, give accuracy. According to the State Handbook of Geology (1922) the land surface is 36,045 sq.mi.; rivers and small lakes cover 280 sq.mi. and the southeast corner of Lake Michigan 230 sq.mi., making a total of 36,555 square miles. The centre of population of the United States in the 1930 census was near Linton, in Greene county. The population of the State, according to that census, was 3,238,503 (1938 estimate, about 3,500,000), of whom 3,116,136 were white and 111,982 Negroes. A larger per cent (92%) of the population than in any other State, is native born. The largest foreign group was 28,152 German-born immigrants. About 12% of the population lives on farms. There are 92 counties and 1,016 governmental townships in the State.

History.—The 81st session of the General Assembly was confined to its constitutional term Jan. 5-March 6, 1939; the lower house was Republican, the upper, Democratic. The principal legislation passed and approved was revision of the liquor laws (abolishing ports-of-entry and their import fees), and provision for unemployment compensation.

Governor M. Clifford Townsend; Lieutenant Governor and President of Senate, Henry F. Schricker; Speaker of House of Representatives, James M. Knapp; United States Senators, Frederick Van Nuys and Sherman Minton; Chief Justice, Michael L. Fansler.

Education.—The enrolment in public schools from the kindergarten through high school for the school year 1938-39 was 678,858 of which 23,924 were coloured; an additional 54,888 were enrolled in parochial schools. Current expenditures for the same year on public schools, not including colleges and universities, were \$50,675,798. Of these, \$4,990,095 was for transportation. In addition, there was a capital outlay of \$8,812,970. The closing of small, one-room schoolhouses has been a marked feature for the last 20 years. Hence the transportation of children to consolidated schools has been an increasing item of expenditure. The total number of public schools in operation in the State in the school year 1938-39 was 3,194; at the beginning of the school year 1939-40 there were 3,027. After 1940 four years of college will be required for licences to teach in elementary as well as in high schools.

Indiana university at Bloomington, Purdue university (the land grant university) at Lafayette, the Indiana State Teachers college at Terre Haute, and Ball State Teachers college at Muncie, are State-supported higher institutions of learning.

Charities and Correction.—Public care of needy, dependent, and delinquent classes during 1939 included, in addition to Federal relief and work projects and voluntary benevolence, direct relief administered by township trustees (\$13,016,426 in the year ending Dec. 31, 1938, as compared with \$7,589,578 in 1937) monthly awards, \$17.25 per month, under supervision of the State department of public welfare, to about 65,080, the maintenance of some 35,000 dependent children, monthly grants (about \$20 on the average) to 2,500 needy blind persons (the cost of this was shared by county, State and Federal Governments), and care of inmates in State institutions.

Banking and Finance.—June 30, 1939 there were in the State

386 State and 126 national banks, a total of 512 (a decrease of nine, as compared with 1938) with a total capital of \$104,172,450 (also a decrease). Principal assets and liabilities were: general market bonds held \$71,752,686 (a decrease); loans and discount, \$283,063,200; State, county and municipal bonds, \$53,228,967; U.S. Government securities, \$269,508,423; total cash and balance with banks, \$310,873,312; savings deposits, \$264,245,681, demand deposits, \$559,912,273, all increases, except as indicated, as compared with 1938.

The total revenue receipts of the State of Indiana for the year ending June 30, 1939, were \$84,347,458, including: from gross income tax \$19,981,968 (\$22,339,541 in 1938), from gasoline tax \$23,071,966 (\$22,717,437 in 1938) and from property tax \$5,981,566. State funds distributed to local units amounted to \$36,804,485, the largest items being for schools and roads. Federal aid to all units in the State and distributions for unemployment compensation during the fiscal year 1938-39 amounted to \$46,800,485; total property tax, all units, \$99,473,099; total revenue receipts exclusive of State distributions, \$184,547,069; grand total revenue receipts, all units, \$228,458,704. Total gross disbursements by the State in the year ending June 30, 1939 were \$162,095,683, compared with \$128,686,116 in 1938, most of the increase being accounted for by three new items: payments of unemployment compensation benefits of \$18,704,969, Federal funds disbursed in the amount of \$9,405,955, and unemployment compensation collections by the State transferred to the Federal Government in the amount of \$4,488,334. Total Government payments (all units), were \$191,994,321.

Agriculture.—The latest available figures are given; those for 1938 and 1939 are preliminary. Acreage of crops reported in 1938, 10,276,000 (10,877,900 in 1937). Production of four principal crops in 1938: corn, 173,389,000bu., 40,000,000 less than in 1937; wheat, 30,240,000bu., 4,500,000 less than in 1937; oats, 34,060,000bu., 11,000,000 less than in 1937; soybeans, on 828,000ac. (16,000 more than in 1937), 8,464,000bu., about 2,600,000 more than in 1937. The total farm value of crops in 1937 was \$190,937,000, in 1938 it was \$146,522,000; income from crops in 1937, \$74,556,000; from livestock and livestock products \$228,974,000; from Government payments \$8,624,000, gross income \$312,154,000—in each instance less than in 1937. Estimated total of cattle on farms Jan. 1, 1939, 1,633,000, 1% greater than a year before; hogs, 3,405,000, 7% greater; sheep, 714,000, same as the year before. The yield of corn per acre (1938) averaged 41bu., slightly above the general average; the average yield of wheat per acre 16bu., slightly less than the previous average.

Industry and Transportation.—Manufacturing has far outstripped agriculture in the last two decades in the number of men employed and in the production of wealth. The total value of manufactured products in 1937 (the latest year for which figures are available) was \$2,497,548,000, of which \$1,018,980,000 was counted as value added by manufacturing. Indiana ranks first among the States in the manufacture of iron and steel from crude ore, of kitchen cabinets, and in the fabrication of cotton gloves. The largest glass fruit jar factory in the United States is at Muncie; the largest petroleum refinery, at Whiting, and the largest automobile tire inner-tube factory at Indianapolis. Food products and pharmaceutical products are also extensively manufactured.

Minerals.—Principal mineral resources are bituminous coal, lying chiefly in the southwestern quarter of the State (16,000,000 to 30,000,000 tons per year extracted by strip and shaft mining); limestone in Owen; Lawrence and Monroe counties, the greatest source of oolitic limestone for building in the United States; clay, used extensively in building and paving brick, and in pottery; sand and gravel used in building and even more extensively in road-making; petroleum, the production of which was increased

during 1939 through the opening of new fields in the southwestern part of the State. Portland cement also is manufactured on a large scale. (C. B. C.)

Indians, American. The Indian population of the United States is on the increase. From an estimated total of something in the neighbourhood of 850,000 at the time of the discovery of America it sank to less than 250,000 in the 1890s. Since then there has been a gradual but steady increase, and the records for 1939 indicate a present population of 351,878. Since 1930 there has been a steady and continuous decrease in the death rate which for 1939 reached 13 per 1,000, or only 2% greater than that of the white population. There has been a similar continuing increase in the birth rate which for 1939 equalled 22.7 per 1,000, which is considerably above the white rate. Surprising as it may seem, this period has also seen an increase in the total number of full blood Indians and in the rate of their increase. As most of the Indians of Arizona and New Mexico are full bloods and are living in areas apart from whites this condition is likely to continue.

The Indian Reorganization Act of June 18, 1934 extended by the Oklahoma Welfare Act of June 26, 1936 and the Alaska Act of May 1, 1936 has made possible fundamental changes in the relationship of the American Indian to the Federal Government. The new Federal statute offers the Indians of today the opportunity to revive or continue their tribal type of organization as a governmental unit under law. These tribal organizations may incorporate and borrow Federal funds for use by the tribe or for reloan to individual Indians. The law made organization optional and each tribe was required to accept or reject the Act by a secret ballot vote before June 18, 1936. Of the 266 recognized Indian tribes, bands, or pueblos within the continental United States, 189 availed themselves of the new law, and of these 120 are in various stages of organization. Seventy-seven groups rejected the Act.

Since 1936 loans amounting to \$4,068,411 have been authorized for 53 of the organized groups; tribes have loaned \$785,615 of their own money to individual Indians; and unorganized tribes have been furnished \$522,946 of Federal credit from other sources. The Reorganization Act terminated the allotment policy under which approximately 100,000,000 acres of Indian land had been lost during the 50 years preceding the Act and made possible the re-acquisition of land for Indians. In various ways since 1933, the remaining 52,651,000 acres of land under the jurisdiction of the Indian Office have been increased by 2,907,143 acres.

During 1938 and 1939 research workers of the Indian Medical Service announced discovery of a filterable virus as the cause of trachoma, an eye disease affecting about 20% of the Indian population. Several Indian Service hospitals have experienced remarkable success in the use of sulphaniilamide as a specific for its relief and in many instances its cure. There has been a continuing decrease in the death rate from tuberculosis indicating that Indians are developing an immunity similar to that possessed by whites.

Soil conservation activities on Indian reservations are bearing fruit in a revival of vegetative cover; Indian timber is being developed on a sustained yield basis; increased areas of Indian farm and grazing land are being withdrawn from lease and Indians are being taught to make profitable use of it themselves; additional irrigation developments are permitting more efficient use of land unsuited to dry farming. Despite all of these activities, there remains an increasing body of Indian people without land resources.

Steps are being taken by the Indian Education Service to encourage the development or use of a written form of several native

languages, in order to facilitate Indian understanding of activities being undertaken upon their behalf. (W. W. B.)

Indo-China, French: see FRENCH COLONIAL EMPIRE.

Industrial Research. The principal results of progress in 1939 are seen in the field of synthetic organic chemistry, including hydrocarbon derivatives, fine chemicals, plastics, and textile fibres. Metallurgy, glass technology, and building science have been helped forward by numerous improvements.

United States.—Over \$190,000,000, probably as much as \$215,000,000, was expended by manufacturers in supporting industrial research. During the year the cornerstones of all the regional research laboratories of the Bureau of Agricultural Chemistry and Engineering, U.S. Department of Agriculture, were laid. Many improvements in chemical processing equipment and in chemical products were displayed at the 17th Exposition of Chemical Industries. Many industrial research laboratories were increased in facilities and personnel. The New York World's Fair and the Golden Gate International Exposition had exhibits of interesting recent research creations of American industrial laboratories. Largely under the leadership of the Air Hygiene Foundation of America, advances were made in coping with numerous health hazards in American industries.

The Bureau of Mines investigated many problems in mineral technology. Marked advances were made in phase equilibrium studies of portland cement clinker. Outstanding in the glass industry was the development of safety glass for use particularly in automobile windshields combining the rubbery strength of polyvinyl acetal plastic with plate glass to produce a safety glass of great strength under all temperature conditions, but also sufficiently yielding to reduce passenger injuries on impact with it. An important development in the field of structural glass has been accomplished by the design of a new glass block containing a sheet of "Fiberglas" sealed into the block. An ultra-low expansion glass has been developed which promises the possibility of manufacture by mass production method of glass cooking utensils having properties superior to previous glass dishes and at a reasonable cost. High intensity mercury lamps were further improved. The sealed beam automobile headlight, a new type of gas-insulated X-ray tube, and a process for removing glare from reflected light on glass by the application of thin chemical films to the surface of the latter, came from researches of 1939. About \$10,000,000 was spent by the steel industry for scientific research. It was found that quite small amounts of silver can cut down the salt water corrosion of stainless steels very considerably. The Kinthead process consists of alloying the surfaces of steel sheets and shapes with coatings of stainless steel or other metals. New alloys were developed for the automobile industry. Among the investigations carried out at the National Bureau of Standards was a broad research on the effects of continuous weathering on light-metal alloys used in aircraft. Progress came in the realm of power generation from the use of high pressure, high temperature turbines with hydrogen-cooled generators. Refinements occurred in the utilization of electric power in the industries.

Brilliant triumphs are seen among the achievements of applied organic chemists. Hydrogen fluoride was demonstrated to be a superior catalyst for many organic reactions. Several hundred derivatives of the nitroparaffins have been prepared in the laboratory. An advance was made in the production of mustard gas by speeding the reaction of ethylene oxide and hydrogen sulphide. The study of diketene and its reactions was continued. Parthenocarp, the technique of producing fruit from unpollinated flowers, was benefited by two new growth substances, naphthalene acetic

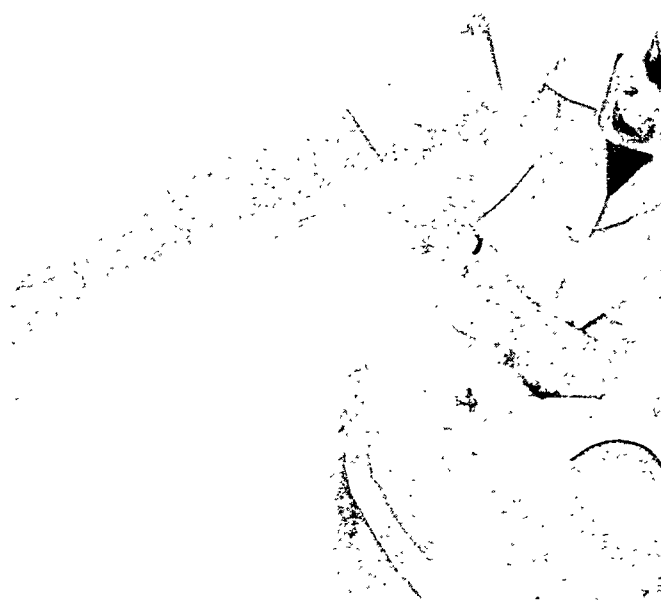
acid and naphthalene acetamide. More than one-third of the vanillin consumption of the United States is being made from calcium ligninsulphonate. A new synthetic musk was disclosed. Synthetic camphor made from turpentine has broken the monopoly of Japan. It is said that the sulphanilamide derivatives reported by chemists working to produce new and better remedies of this kind now total about 800. The synthetic organic insecticide field has such potentialities that it is being cultivated researchfully in a broad way. By the end of 1940 it is estimated that most of the present 125,000,000-gal. aviation market will be supplied by 100-octane aviation gasoline.

At the Forest Products Laboratory anti-shrink treatments for wood are being developed, laminated construction is being studied broadly, and containers are getting constant attention. Experimentation in the manufacture of newsprint from southern woods is being continued. Sulphite pulp made from Georgia pine is said to be satisfactory for the production of viscose rayon. "Teca" is the name of a family of cellulose acetate rayon staple fibres, characterized by an inherent stabilized crimp. To bring "Nylon," announced in 1938, into general commercial production as soon as possible, \$2,500,000 is being spent on plant extensions at Belle, W. Va., for making "Nylon" intermediates, and \$8,500,000 on the erection of a "Nylon" textile plant at Seaford. "Vinyon," also announced in 1938, is particularly well suited for use in industrial filters ("Vinyon" duck) and for raincoats, fish lines and nets, boat sails, and bathing suits. Addition of still another member to the rapidly increasing family of filaments derived from purely synthetic resins is forecast by a patent recently granted for the production of elastic fibres from polyisobutylene of high molecular weight.

"Etho-raon" is a new fibre, a substitute for silk in the manufacture of hosiery yarn. Chemists are actively studying the possibility of producing fibres and foils from soybean protein and from zein. The Cotton Research Foundation has been adding valuably to the chemistry of cottonseed. Progress in soybean technology has been so rapid in the past few years that it is difficult to keep abreast of the developments.

Expansion of the direct use of latex has continued, many 1940 cars being equipped with foamed latex seat cushions. "Cryo-Vac" involves food products in odourless, tasteless natural rubber bags prepared from specially compounded latex. Advances were made in oil-resisting rubber. The extension of antiseptic rubber goods came from more research. Chlorinated rubber received impetus. Forward strides were made in the technology of "Pliofilm" and "Pliolite." High wartime prices for natural rubber may combine with lower production costs for the elastomers ("synthetic rubbers") as volume grows to enlarge the field within which they can compete with rubber. A practically odourless "Neoprene" was marketed. A new rubber-like material is synthesized by the polymerization of isobutylene. Butane has been reported as a cheap source of butadiene.

Methods of producing acrylic ester resins from lactic acid obtained from whey have been reported by the U. S. Bureau of Dairy Industry. The year 1939 has seen important advances in the development of methods and equipment for fully automatic compression moulding. Rapid-setting cast phenolics have been made generally available. Owing to the light weight, colours, effects, and ease of cleaning obtainable with plastics, these materials are being used in ever-increasing quantities for decorating and furnishing airliner cabins. Plastic lighting reached prominence in 1939, through the use of urea resin reflectors on laminated sheets. There was described the commercial availability of several grades of polyvinyl alcohol in powder form, indicating present mill development of its use for paper coating and adhesive purposes. Polyvinyl acetal-type resins are expected to have increased appli-



NYLON STOCKINGS were first placed on sale in 1939

cation in the field of electric wire insulation. The year 1939 has seen extension of the use of polyvinyl chloride solutions for the impregnation of fabrics. A new process, as yet undeveloped commercially, has been described for the electrodeposition upon metal surfaces of synthetic resins dissolved in hydrophobic solvents, such as mineral oils. Further study of the vinyl resins as adhesives and for paper coatings has resulted in several industrial applications. The use of these resins in the manufacture of paper hoods for milk bottles has been put on a commercial basis.

Among the new "Vinylite" products are synthetic resins in the improvement of plywood properties. It has been a year of activity in the development of the use of laminated phenolic resins in aeroplane construction, both in the U. S. and elsewhere.

Canada.—A special type of paint for use in marking road centres contains ground glass which reflects motor car headlights at night, making the traffic lanes quite visible. The mechanism and kinetics of the sulphite process were investigated. Western Canada flaxseed was studied chemically. The chemistry of lignin was enriched by research of 1939 and interest has been shown in the development of lignin plastics.

Among the investigations in progress under grants from the National Research Council are the preparation of powdered apple, determination of the seasonal variation in water and gas content of species used in the pulp and paper industry of Eastern Canada, action of bacteria and enzymes on carbohydrates and polysaccharides, mineral deficiency of Quebec soils, and concrete deterioration.

Brazil.—Efforts are being made to learn the technical aspects of the use of wood and charcoal as motor fuels. The expansion of industrial applications of papoula, the hemp of San Francisco, was investigated. Babassu nuts and carnauba wax were studied from the standpoint of utilization in native manufactured goods.

Great Britain.—British scientists have been indexed and classified, but not regimented, for war purposes. The Road Research Laboratory of the Department of Scientific and Industrial Research investigated fillers for tar and other bituminous surfaces. Rubber in powdered form has been recommended for incorporating with asphalt to improve the properties of the latter for road building purposes. The Fuel Research Station continued studies on the hydrogenation of tars on a pilot-plant scale. The Building Research Station studied the solubility of cement: permeability and extraction of lime are the main causes. Advances were made in the knowledge of the control of inclusions in steel, the effect of temperature on the properties of steels, creep resistance, and alloying. The work of the Electrical Research Association, which has been carried out at a total cost of \$400,000, has resulted in annual economies of approximately \$5,000,000, and investigations completed by the Iron and Steel Research Council are expected to save nearly \$2,000,000 a year in the production of pig iron and over \$6,000,000 annually in the cost of coal used in the manufacture of steel. During the year 1939 the new laboratories of the British Non-Ferrous Metals Research Association were opened in London. Among the new products shown at the British Industries Fair of 1939 were two

phenolic resins, several water-soluble resins, nonphenolic maleic resins, and phthalic ester plasticizers. Perhaps the most important new application of moulding resins during the year 1939 has been the production of a coffin, using a special "Bakelite" powder. Luminous moulding powders have been introduced. Physical modification of viscose rayon by stretch-spinning techniques has resulted in the production of a high tenacity viscose rayon ("Tenasco"). The use of polyamide resins for making yarn has been developed. Rubber threads are being employed in divers ways.

Netherlands.—"Mealorub," a powder containing 96% of rubber, produced by the Proefstation, West Java, is easily mixable with other substances and enables direct moulding of rubber and rubber-resin compositions. The Dutch Quinine Syndicate is endeavouring to find new uses for quinine in industry.

Belgium.—"Ethanite" was described as a rubber-like material obtained from olefins contained in cracked gas. At Port-Jerome phenol was found to be especially adapted to the solvent refining of lubricating oils.

France.—Industrial hygiene is being encouraged. Sulphonated naphthenamides were learned to be good wetting agents for textiles. Nitropentaglycerin is looked upon as a potential substitute for nitroglycerin. "Cristaplem" is a process for moulding cellulose acetate in plaster of Paris. Eight woods of French tropical Africa were studied for paper-making. A French company has introduced truck tires wherein metallic cables are used instead of textile cords.

Italy.—The possibility of Italy remaining neutral in the European war intensified production and research already active in the chemical field. Dimethylacetol has been found to be a satisfactory anti-knock for ordinary use. "Catagas" is water gas produced by the reaction of steam on gas oil instead of on coal. "Nitrometrol" is a new high explosive made from glucose and methanol. Bamboo was investigated as a source of alpha-cellulose. Crease-proof fabrics are being made with the aid of melamine resins. "Lenasel" and "Autar" are two new resistant fibres. The preparation of a textile fibre from fish skin is under development.

Germany.—The German chemical industry is now subject to an elaborate system of official wartime control. Germany is relatively favourably situated as to its zinc supply. Germany's copper-smelting industry has made progress in recent years owing to the increase of productive capacity and modernization of plants. The production and consumption of magnesium and aluminium increased in 1939. In the field of concrete the use of prestressed reinforcement is said to minimize tensile stresses and thereby to reduce cracking. Safety services have been advanced through research in industrial hygiene. It is thought in general that the prospect of finding new war gases appreciably more toxic than those already known is small. Germany's motor and aviation fuel needs have been well investigated. Lubricating oils especially for aeroplanes are being produced by an electrical discharge process that is said to increase viscosity. Researches on cellulose have related to constitution, digestion processes, lignin, bleaching, refining, and especially derivatives. A new fibre for use in place of jute, "Zelljute," was exhibited at the Leipzig Fair. "Pe-Ce" is a textile thread of polyvinyl chloride. "Ultrapas," a thermosetting melamine resin derived from dicyandiamide, is claimed to be easier to work and to give more beautiful results than urea plastics. The employment of moulded plastics in the manufacture of automobiles is said to be expanding rapidly. An apparently new development in bearing material is reported in the form of "Lignofol," a highly compressed resin-impregnated wood, of which bearings more than two feet across have been made. Full-scale manufacture of "Buna" ("synthetic rubber") in Schopkau, the first big works of its kind to be erected under the four-year plan, was begun during 1939. The production of synthetic fatty acids from paraffin will be increased to 30,000-40,000 tons yearly (from 60,000 tons of paraffin) because of the scarcity of fats for the soap industry.

Sweden.—The application of scientific research has been an important factor in attaining the success of the Consumers' Co-operative Union. Water pollution from sulphate cellulose plants has been investigated, and the lye waste from sulphite factories is now yielding "Sulfo-Glue," a substitute for animal and vegetable adhesives.

Norway.—A new phosphate fertilizer, "Orofosfat," was developed. The vitamin D potency of a number of different fish and fish products has been determined by the Norwegian Canning Industry at Stavanger.

U.S.S.R.—Sulphuric acid technology was improved by Soviet research of 1939. An investigation has shown that air is demercurized by hydrogen sulphide. Precarbonation of the mixture was found to intensify the ammonia-soda process. Research was continued on the utilization of Uralian titaniferous magnetites. By covering the steel parts of aeroplanes with a cadmium coating effective results were obtained. The technologies of aluminium, lithopone, and tar hydrogenation seem especially well advanced.

South Africa.—A Government committee has recommended a survey of coal deposits to determine the supply available for the Fischer-Tropsch and hydrogenation processes of making oil and gasoline. The use of fertilizers in South Africa is being stimulated by experimental work conducted by colleges of agriculture and in the private demonstration plots of manufacturing companies. A general survey of fish products has been undertaken with the object of insuring their more efficient utilization. Acetylene is being used to ripen fruit.

India.—Research has been done on the separation of titanium dioxide from bauxite. At the research laboratory of the Department of Industries of the Government of Bombay one of the projects related to the production of insecticides from waste tobacco. The Government of Assam has been considering an experimental cinchona plantation.

Australia.—The pulping properties of eucalyptus using the sulphate process were reported, and the preparation of menthol and thymol from eucalyptus oil was begun in Western Australia. The Council for Scientific and Industrial Research described the losses of the constituents of flax straw during retting and its investigations of chilled beef, microbial contamination acquired in meat plants, and cooling and storage in packing houses.

Japan.—Research is being conducted on the production of potash from cement dust and on uses for magnesite, especially in ceramics. Much research has been carried out on steel manufacture. Alunite from Chosen and alum shale from Manchoukuo have been investigated as sources of

aluminium, now mostly produced from imported bauxite. Facilities for research on coal hydrogenation and related processes are under expansion at Hsinking. A process of manufacturing aircraft lubricants from whale, sardine, and herring oils is to be industrialized. The retting of vegetable fibre materials was investigated broadly. Formosan vegetable tannins have received research and synthetic tanning materials will soon be produced commercially. The coalescence of the small textile research laboratories into one large establishment to be aided by the Government is a project under discussion. Reports have come of quadrupled production of soybean wool. The use of alginic acid in the manufacture of staple fibre continues to get attention. The synthesis of chloroprene from vinylacetylene has been accomplished by several workers. (See also CELLULOSE PRODUCTS; CHEMISTRY; CHEMISTRY, APPLIED; CHEMISTRY AND ENGINEERING, AGRICULTURAL, U.S. BUREAU OF; CHEMURGY; PLASTICS INDUSTRY.)

(W. A. HA.)

Infantile Paralysis. The year 1940 is the 100th year since infantile paralysis—poliomyelitis—has been known as a distinct disease. The German orthopaedic surgeon, Jacob Heine, first described individual cases of the malady, not suspecting it was infectious. The Swedish physician Medin 50 years later described the disease in epidemic form. It was not until 30 years ago that the Austrian bacteriologist Karl Landsteiner was able to transmit the illness to laboratory animals—and then only to apes and monkeys.

Monkeys are expensive laboratory animals. The disease never even in its worst outbreaks attacks a large proportion of a population. These facts have made progress in acquiring knowledge very slow. In 1939 a discovery of capital importance gave promise of more rapid clearing up of this baffling and mysterious ailment. Charles Armstrong of the National Institute of Health has transmitted the disease to the Eastern cotton rat, *Sigmodon hispidus hispidus*. At last investigators will have an animal that is cheap, docile, and easily bred in captivity.

Though accumulation of knowledge in regard to infantile paralysis has been discouragingly slow, yet a few facts are agreed upon by bacteriologists and public healthmen concerned with studying and fighting it. From fatal cases of the disease a sub-microscopic infectious agent—a filtrable virus—can be passed to monkeys, giving them a similar paralytic sickness. It is further known that, though few persons in any given epidemic come down with paralytic signs of the disease, yet the virus may well be widely distributed in the population—infected but not visibly sick. This seems true because the majority of U.S. people, and the more the older, show virus-killing power in their blood in spite of the fact they have never shown paralytic sickness. Then too, in 1939, Kramer, Gilliam, and Molner—by using a new technique of passing the virus from humans to monkeys—have actually demonstrated the virus in the intestinal discharges of a large proportion of infants and children who had been in close contact with frank cases of the disease in an epidemic in Detroit, Michigan.

Does this mean that the frank cases had spread the virus to their neighbours, who were for some mysterious reason immune? Or that the healthy "carriers" had spread the virus to the non-immune children who became sick? This can not yet be answered. All that can be said is that, during an epidemic, the infantile paralysis virus can be found in a lot of healthy as well as sick people. Just the same, since Kramer and his co-workers and Drs. Paul and Trask, confirming them, have found the virus in the intestinal contents of people, it appears that public health measures controlling this source of exit of the virus from human beings will be advisable. Is the virus spread only by contact from person to person? This is not yet known. There may be still unsuspected animal reservoirs of the disease. Unsuspected insects may carry it. How does the virus get into people? This again is an open question. For some years it was generally believed that the virus—which is known to have a high affinity for nervous tissues—entered the human body only by the endings of the nerves of smell. In the laboratory, monkeys could be infected by dropping virus into their nostrils. But now a certain species of monkey—

Macacus irus—is found infectible by merely swabbing the virus lightly on its tonsils. And, at autopsy of children dead of infantile paralysis, little trace of invasion by way of the nerves of smell can be discovered. This calls into serious question the power of chemicals like zinc sulphate—powerful protectors of monkeys against infection by the nose route in the laboratory—to protect children during epidemics.

Since thirty years of laboratory research with monkeys have failed to give public healthmen means to control the disease, it is now demanded that scientists return again to the study of the disease in nature in human beings. A nation-wide co-ordinated plan of epidemic detective work is now under consideration by the National Foundation for Infantile Paralysis.

The discovery of a cheap and easily handled small laboratory animal, the cotton rat, brings hope for more rapid progress against this most mysterious of all infectious diseases during the coming years. Up till now, it must be admitted, we do not know how to prevent or to cure infantile paralysis. But the cotton rat discovery is putting new heart into hitherto baffled searchers.

BIBLIOGRAPHY.—Charles Armstrong, *U.S. Public Health Reports*, (Sept. 29, 1939); S. D. Kramer, A. G. Gilliam, and J. G. Molner, *U.S. Public Health Reports*, (Oct. 27, 1939). (P. DE. K.)

Infant Mortality. Comparisons of infant mortality among communities are based upon the infant mortality rate, that is, the ratio of the number of deaths among children under one year of age to the number of live births. Thus, the United States in 1938, with 116,412 deaths under age one and 2,287,980 live births, had an infant mortality rate of 51 per 1,000. England and Wales had an infant mortality rate of 52 per 1,000 live births in 1938. Infant mortality varies widely among the countries of the world. New Zealand usually experiences the most favourable rates, that for the period 1936 to 1938 being 33 per 1,000. Chile, with a rate of 243 per 1,000 in the same period, is one of the countries with very high infant mortality.

Many countries of the Western world have recently experienced great improvements in infant mortality. Thus, England and Wales, with rates per 1,000 of 154 and 52 in 1900 and 1938 respectively, had a two-thirds reduction. The rate in the United States was practically halved over the years from 1915 to 1938, the fall being from 100 to 51 per 1,000. These notable decreases in infant mortality result principally from better sanitation and a general rise in the standard of living. Specific beneficial factors are the pasteurization of milk, systems of food inspection, the screening of dwellings to keep out flies, and the organization of agencies that provide prenatal and neonatal care.

The following infant mortality rates per 1,000 live births for the United States in 1917 and 1937 respectively indicate the extent to which various causes of death have shared in the general decline: Diarrhoea and enteritis, from 20 to 5; premature birth from 19 to 15; congenital debility, from 9 to 4; congenital malformation, from 6 to 5; bronchitis and bronchopneumonia, from 11 to 6; and influenza and lobar pneumonia, from 5 to 4. Infant mortality from injury at birth, which increased sharply from 1917 to 1931, has since been declining and by 1937 the rate had fallen to 4 per 1,000 live births. Other conditions with a consistent downward trend in their mortality are syphilis, tuberculosis and diphtheria. Declines in infant mortality have been relatively greater in the later months of the first year of life than in the earlier months.

Among Negroes in the United States, the infant mortality rate in 1937 was 83.2 per 1,000 live births, while among white persons it was only 50.3 per 1,000. (See also BIRTH STATISTICS.)

BIBLIOGRAPHY.—"Declines in Infant Mortality from the Principal Causes of Death," *Statistical Bulletin of the Metropolitan Life Ins. Co.* (July, 1939); Robert M. Woodbury, "Infant Mortality in the United States,"

Average Annual Infant Deaths

(Per 1,000 live births in certain countries for the period 1936 to 1938 and for each year in the United States from 1915 to 1938 and in England and Wales from 1900 to 1938)

Country	Infant Deaths per 1,000 Live Births 1936 to 1938	Year	Infant Deaths per 1,000 Live Births	
			United States (c)	England and Wales
North America		1900	...	154
United States	54	1901	...	151
Canada	68	1902	...	133
Mexico	131 (a)	1903	...	132
South America		1904	...	145
Argentina	97			
Chile	243	1905	...	128
Uruguay	97 (b)	1906	...	132
Venezuela	137	1907	...	118
Europe		1908	...	120
Austria	87	1909	...	109
Belgium	78			
Bulgaria	146	1910	...	105
Czechoslovakia	123 (a)	1911	...	130
Denmark	68 (a)	1912	...	95
Eire	71	1913	...	108
England and Wales	56	1914	...	105
Estonia	90 (a)			
Finland	67 (a)	1915	100	110
France	66	1916	101	91
Germany	63	1917	94	96
Greece	116 (a)	1918	101	97
Hungary	136	1919	87	89
Ireland, Northern	76			
Italy	103 (a)	1920	86	80
Latvia	78	1921	76	83
Lithuania	120	1922	76	77
Netherlands	38	1923	77	69
Norway	42 (a)	1924	71	75
Poland	139			
Portugal	147 (a)	1925	72	75
Rumania	179	1926	73	70
Scotland	77	1927	65	70
Spain	111 (b)	1928	69	65
Sweden	43	1929	68	74
Switzerland	46			
Yugoslavia	141 (a)			
Asia		1930	65	60
India, British	163 (a)	1931	62	66
Japan	110 (a)	1932	58	65
Palestine	129	1933	58	64
Other Countries		1934	60	59
Australia	39			
Egypt	163 (a)	1935	56	57
New Zealand	33	1936	57	59
Union of South Africa (Whites)	60 (a)	1937	54	58
		1938	51	52

(a) Average for 1935 to 1937.

(b) Average for 1935 and 1936 in Uruguay and for 1934 and 1935 in Spain.

(c) Official data begin with 1915. For years prior to 1933, the infant mortality rates relate to an expanding area within the United States.

Annals of the American Academy of Political and Social Science (Nov. 1936). (A. J. Lo.)

Infantry: see ARMIES OF THE WORLD; LIGHTNING WAR; MUNITIONS OF WAR; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR; EUROPEAN WAR.

Initiative and Referendum. Federal: *Indian plebiscites* on constitutions resulted in 109 adoptions, 5 rejections; charters, 78 adopted, 3 rejected; October 28, proposed constitution rejected at Standing Rock Agency, 519 to 337. *Marketing quota referenda:* Tobacco (Flue-cured), October 5, c. 90% for, 10% against; (Burley), November 21, c. 80% for; Cotton, December 9, c. 91.4% for. *California:* November 7, five proposals submitted, three defeated, viz. (1) Constitutional amendment ("Ham and Eggs") 1,933,557 to 993,204; (2) initiated measure (regulation of chiropractors), 1,894,764 to 801,173; (3) (referred act) oil and gas control (indorsed by President Roosevelt), 1,755,625 to 1,110,316; two other referred acts to regulate personal property brokers were adopted: (1) 1,853,663 to 753,480; (2) 1,850,811 to 732,873; see "Popular Lawmaking in California," *Minn. L. Rev.*, xxiii, 559 (Radin). *Connecticut:* In a total vote October 3, smaller by nearly 10,000 than that of the preceding election, the proposed council-manager charter, for Waterbury, was rejected (14,726 to 10,513). *Mississippi:* November 7, adopted (57,326 to 4,848) constitutional amendment authorizing devise, at least 90 days before testator's death, of not more than one-third of his estate to a "charitable,

religious, educational, or civil institution" even though he has direct heirs; a contrary art. (269) of the Constitution was repealed (58,354 to 4,847). *New Jersey*: June 20, adopted (457,225 to 301,128) constitutional amendment authorizing pari-mutuel betting at races; November 7, voted (391,604 to 344,483) \$21,000,000 relief bond issue. *New York*: November 7, adopted (1,225,495 to 594,811) constitutional amendment authorizing pari-mutuel betting at horse races; there were 2,173,422 void and blank ballots; see *Cornell L. Quar.*, xxiv, 1 (A. E. Sutherland); a referendum on reform of greater New York county governments, was prevented by a Supreme Court decision; Binghamton voted (11,831 to 6,913) for daylight saving; Mt. Vernon voted (7,562 to 7,484) to abolish the elective office of council president, but against election of members by wards (7,832 to 7,101); New Rochelle, by 9,643 to 4,124, and White Plains by 6,278 to 3,363, rejected proportional representation. Peekskill's charter, was judicially voided for failure to post required notices. (*Cortland v. Peekskill*, 102, *N.Y.L. Jnl.*, No. 135). *North Dakota*: June 11, rejected (165,851 to 41,152) (1) referred act to abolish grain storage commissioner's office; (2) municipal liquor control (170,538 to 41,814); (3) diversion of highway construction funds (172,513 to 39,789); (4) gross income tax, 168,976 to 36,117 (the last three were initiated measures). *Ohio*, November 7, rejected (1) State Bd. of Education Amendment (1,137,054 to 747,545); old-age pension amendment (1,546,207 to 464,670); (3) amendment to reduce number and localities of initiators (1,485,919 to 406,612); (4) proposed changes in civil service law (1,132,279 to 634,269). *Oregon*: July 8, Multnomah Co. Cir. Court upheld "anti-picketing act," adopted in 1938 referendum (*Am. Fed. of Labor v. Bain*, *U.S. Law Week*, vii, 126). *Pennsylvania*: September 12, some 500 municipalities voted under local option laws on the question of licensing the liquor traffic. (See Supreme Court decision of September 8). *Philippines*: Amendments of Constitution (sec. 1 [5] and sec. 3 of appended ordinance) by reason of changes in the Tydings-McDuffie Act, voted October 24 (1,393,453 to 49,633), and later approved by President Roosevelt.

Europe.—*Denmark's* proposed constitutional amendments, increasing the power of parliament's popular branch (*Folketing*) at the expense of the upper house (*Landsting*) failed of adoption for want of the necessary 45% of the eligible voters, although the actual vote was 966,277 (44.6% of the whole) to 85,770. *Poland*: On October 22, at an election in the Soviet-occupied areas for delegates to national assemblies to decide the question of joining the U.S.S.R., "official" (Soviet) candidates received in Western Ukraine, 90-93% of the 92.85% voting; in White Russia, 90-67% of the 96-67% voting. (See Lobingier, *The People's Law*, 1909).

(C. S. L.)

Inner Mongolia: see MONGOLIA.

Insanity: see NERVOUS SYSTEM; PSYCHIATRY.

Insects: see ENTOMOLOGY; HORTICULTURE.

Insulin: see CHEMOTHERAPY; DIABETES; GYNAECOLOGY AND OBSTETRICS; INTOXICATION, ALCOHOLIC; PSYCHIATRY; PSYCHOLOGY.

Insurance, Accident and Health. A marked increase in the volume of accident and health insurance and the adoption of this type of insurance as a major "line" by many important American agencies were two important trends of 1939. Hospitalization plans, which had been regarded with misgiving by the accident and health fraternity, have actually turned to the benefit of the latter, because the widespread publicity given such plans has led to a greater receptivity on the part of the public toward accident and health policies. Insurance companies also looked forward during the year to receiving a greater proportion of the hospitalization business.

The non-profit associations themselves have found it necessary in many instances to adopt the basic operation plans of insurance companies for underwriting, settlement and administration.

Several life insurance companies entered the accident and health insurance business in 1939, two of them in the last 60 days of the year. There was also a tendency on the part of life insurance companies to re-enter the field of total disability insurance. (See also INSURANCE, AUTOMOBILE: *Great Britain*; LAW (CASE): *Insurance*.)

Insurance, Automobile. Severe competition was the keynote of the automobile casualty business of 1939. Extremely satisfactory results in 1938 were reflected in sizeable rate reductions, broadened coverages, and frenzied efforts on the part of most companies to increase their volume. The net result is that the public is now receiving more protection at a lower cost, while the premium writings of the companies will probably be lower in total than in 1938, and the ratio of losses to premiums will be higher.

Perhaps the most notable development in the automobile casualty field was the widespread adoption of a classification rating plan for private passenger automobiles based upon the use of the automobile, and the introduction of a rate differential based upon the number of miles operated. Another innovation was the general writing of medical payments coverage, providing for payment of medical bills incurred as a result of injuries sustained by passengers in the insured automobile. With the exception of a new coverage, granted without charge, providing reimbursement for transportation expenditures incurred by reason of loss of use of the automobile due to theft, there were no outstanding changes in the automobile fire, theft and collision field during 1939.

There were the usual number of laws proposed for further regulation of the business, but, aside from the adoption of financial responsibility laws by two additional States, no important changes in State regulation occurred.

(G. E. Ho.)

Great Britain.—Accident and motor insurance includes many different classes, some well established such as workmen's compensation and motor, and others still in process of development such as aviation, credit and contingency. This section of insurance continues to expand and to occupy an increasingly important place in the business. Figures published during 1939 of the business of British offices for 1938 in two of the chief sections, are given below with a comparison with the previous year.

	1938	1937
Motor	Net Premiums	Net Premiums
Employers' liability	£37,651,808	£37,318,352
	9,732,138	8,716,804

Motor business still greatly predominates, but is not now advancing so rapidly as hitherto. The figures in this section are derived from business transacted in all parts of the world, but the largest part of the revenue is provided from Great Britain and the Dominions, and the United States of America. Normally the growth of accident insurance continues steadily in all areas; both through the expansion of existing sections and the development of new ones. No review of the subject for 1939 can however ignore the widespread effect of the outbreak of war. Certain areas from which accident business had been drawn in the past were automatically closed to British offices as from September 3, and though these areas are but a small part of the whole, the effort to make up for the loss of business by extension in other directions is necessarily hampered by the dislocation due to war conditions. These considerations do not apply to the important American field, where trade conditions are likely to accelerate the rate of increase in accident insurance turnover.

In Great Britain and other European countries the progress of the business has already been greatly disturbed. This is prominent

in the motor section, where the volume of business has been substantially reduced owing to cars being laid up, while at the same time the number of road accidents has greatly increased owing to the confusion resulting in its early stages from "black-out" methods. The general financial stringency of the moment is likely to have some influence in reducing the volume of personal accident insurance.

(C. E. G.)

Insurance, Fire. The business of fire insurance during 1939 was distinguished by an increase of about 4% in the losses as compared with an increase of 10% in 1938 over 1937. For two years now the amount of losses has increased which lends some support to the conviction that, after almost a decade of very low loss ratios, the time has come when the loss ratio will begin to approach what might be called a more normal condition. It should be borne in mind that there have been no severe fires or conflagrations for so many years that some are inclined to think they may not occur again. That is probably not true. The conditions in the large cities are not more favourable, when it comes to resisting a conflagration, than they were some years ago. In fact, conditions are probably less favourable, due to the increasing age of many of the buildings and the fact that many are unrented at the present time and are not kept in the best condition. This is only conjecture, but it is worth thinking about. The expenses did not show any appreciable increase during 1939, but taxes do not seem to have reached their limit and have a tendency, of course, to push up other expenditures. Every piece of paper that is handled in business increases the general expense.

The fire insurance companies are not troubled any more than other investing bodies by the lack of securities which are paying what might be called a fair return. The low return on Government securities is only possible because there are not good investments in other fields; in other words, the Government for many years has not had much competition from other investments. The portion of the assets invested in Government bonds tends to increase slightly and will do so until a normal investment market is reached.

The tendency, noticeable for some ten years perhaps, towards protecting against many hazards under one cover has been accentuated very remarkably during the past year. The form known as the Extended Coverage Endorsement No. 4 is especially referred to. In one piece of paper it covers approximately ten kinds of loss to which the insured might be exposed. A few years ago the insured, in order to be completely protected, would have needed a separate endorsement or policy for each of these hazards; now protection against them can be secured in one endorsement and at a rate which is extremely modest. Perhaps this is one outstanding way in which the business of fire insurance is developing so as to serve the insured in a more thorough, yet simpler manner. It is not too much to be hoped that in time there will come a form of property insurance which will cover practically every form of risk to which the insured is exposed.

Another important development during 1939 was the adoption in June of a new fire policy by the Insurance Commissioners and Superintendents. At present there are in use in the United States some six standard policies, no one of which has ever won the approval of all the States and all the companies. The new policy, it is hoped, will take the place of these and in time will be in use throughout the country. (See also FIRES AND FIRE LOSSES.)

(E. R. H.)

Insurance, Life. During the year 1939 the legal reserve life insurance companies of the United States and Canada continued to make substantial progress. The total

amount of life insurance (excluding reinsurance) in these companies was estimated at nearly \$120,000,000,000 at the end of 1939, an increase of about 3% over 1938. The new (original) business issued during the year amounted to about \$12,000,000,000.

During the year 1939 these companies paid out to policyholders and beneficiaries the huge sum of \$2,850,000,000 and their assets at the end of 1939 totalled nearly \$31,500,000,000.

The mortality experience during 1939 was very favourable. The death rate from tuberculosis continued to decline to the lowest level ever recorded.

The great progress recently made in the scientific fight on pneumonia was reflected in record low mortality from this cause in 1939.

Safety campaigns; aimed at preventing automobile accidents, succeeded in keeping automobile fatalities at a low level (though not as low as in 1938).

The interest rate earned on the companies' investments continued its downward trend during 1939. While there was some improvement in corporate bond and note financing in the first eight months of the year (and also in the mortgage field), the companies, on the whole, continued to experience difficulties in finding an adequate volume of appropriate and remunerative investments for their new funds. Company holdings of United States Government securities increased less than in previous years, and comprise about 18% of the companies' assets.

The outbreak of hostilities in Europe raised a number of serious problems, particularly for Canadian companies. To protect the general body of policyholders against unusual war losses, all companies doing business in Canada adopted so-called war clauses for Canadian policies. These clauses do not affect the insurance so long as the civilian policyholder remains within the territorial limits of Canada, Newfoundland, and the United States; policyholders in military or naval service are also covered without any extra charge so long as they remain in these home areas, and in the event of going beyond the home areas may, under Ordinary insurance, pay an extra premium to continue the full death benefit abroad. Aviators can obtain full coverage in the home areas subject to an extra premium but not abroad. Since many residents of the United States may likewise be subject to a potential war hazard, a number of United States companies have also begun using various war clauses for policies issued to them. As a general rule policies issued prior to the outbreak of war are not subject to any war restrictions, except in the case of supplementary disability and accidental death benefits.

In the State of New York, whose importance is far reaching as respects life insurance, a general recodification and revision of the Insurance Law was enacted during 1939, effective in most instances Jan. 1, 1940. With regard to the provisions of the law relating to the life insurance contract, non-forfeiture benefits, participation, etc., no fundamental changes from the present law were made but the new code embraces several subjects new to the statute. Among the more important changes of special interest were provisions relative to the insuring of minors and the inclusion of standard provisions for industrial insurance and total and permanent disability benefits. In April 1938, President Roosevelt sent a message to Congress with the request that certain investigations be made in connection with monopolies and, in addition, that the Securities and Exchange Commission be authorized to study insurance investments "with particular relation to their use as an instrument of economic power." Subsequent thereto Congress created the Temporary National Economic Committee to make the authorized investigations and the Securities and Exchange Commission began systematically to bring together information, which dealt not only with insurance investments, but

practically all phases of the life insurance business, for the purpose of submitting material and witnesses during hearings before the Temporary National Economic Committee. These hearings took place intermittently from Feb. 1939 up to and beyond the end of 1939.

Evidence was adduced from officers and other representatives of life insurance companies and tabulations and analyses were prepared and presented by members of the staff of the Securities and Exchange Commission. Those interested in life insurance were asked to present for the record any additional testimony.

(L. A. L.)

Insurance, Marine. It is a regrettable fact that in 1939, as in the previous year, marine underwriters were compelled to devote most of their time to consideration of problems in connection with war.

In the early part of the year the British Government announced the formation of a War Risk Pool to cover all shipments to and from Great Britain. The reason for this was that the British Government was most desirous of having British commerce continue to move in as nearly a normal manner as possible regardless of political conditions throughout the world. This action of the British Government was promptly followed by the governments of other maritime nations in Europe adopting somewhat similar plans. They were all desirous of protecting their foreign trade and their merchant marine against the perils of war.

A war risk bill was introduced in both the Senate and House to put the United States Government in the marine insurance business particularly in respect to war risks. Although the House committee on Merchant Marine held extensive hearings, no action was taken on this bill prior to the adjournment of Congress. However, marine underwriters in the U.S. realized that American importers and exporters must be maintained in a competitive position in their world-wide trading and formed the American Cargo War Risk Reinsurance Exchange with an unlimited capacity to handle all the cargo war risk business written in the United States. Practically every insurance company authorized to write ocean marine insurance in the United States is a member. It is somewhat of an undertaking to have every cargo war risk line written anywhere in the U.S. by the thousands of insurance agents promptly reported to one central office and there sorted for each sailing of each ship no matter from what port or to what port the voyage is made and further reporting to each insurance company member its share of every sailing. However, this was accomplished and the Exchange was in full operation when the European war broke out in 1939. It was most fortunate for all persons engaged in the U.S. foreign trade that the marine underwriters were organized and prepared to meet the shock. There was none of the confusion and uncertainty that prevailed in the marine insurance business in August and September of 1914. But the outbreak of this war put a tremendous burden on the underwriters, meetings of committees have been numerous, the rate committee supervising the rates for American flag, other neutral and belligerent ships have met daily to consider rates to and from all parts of the world and putting them up or down in accordance with what, on the best available information, was considered the real hazard. However, both importers and exporters have an adequate market for their war risk requirements and commerce has not been curtailed in any manner by lack of war risk insurance facilities.

The strictly marine insurance on cargoes as distinct from war risk continues along without change. There has been no increase in rates although there has been a substantial increase in risks brought about by conditions at piers in all ports, and increased navigational hazards. It is probable that when underwriters can find the time to do so consideration will be given to marine rates.

Hull business which is handled by the American Marine Insurance Syndicates has been given careful consideration. The record of each fleet has been examined and where the record has not been good the rate has been increased. Although the trend of rates for the past two years has been upward it is doubtful if the increases obtained have been equal to the increased cost of repairs which due to war conditions will probably be higher than ever in 1940.

(S. D. McC.)

Insurance, Old Age: see LEGISLATION, FEDERAL; SOCIAL SECURITY.

Intelligence Tests: see EDUCATION, ELEMENTARY.

Inter-Allied Debts: see WAR DEBTS.

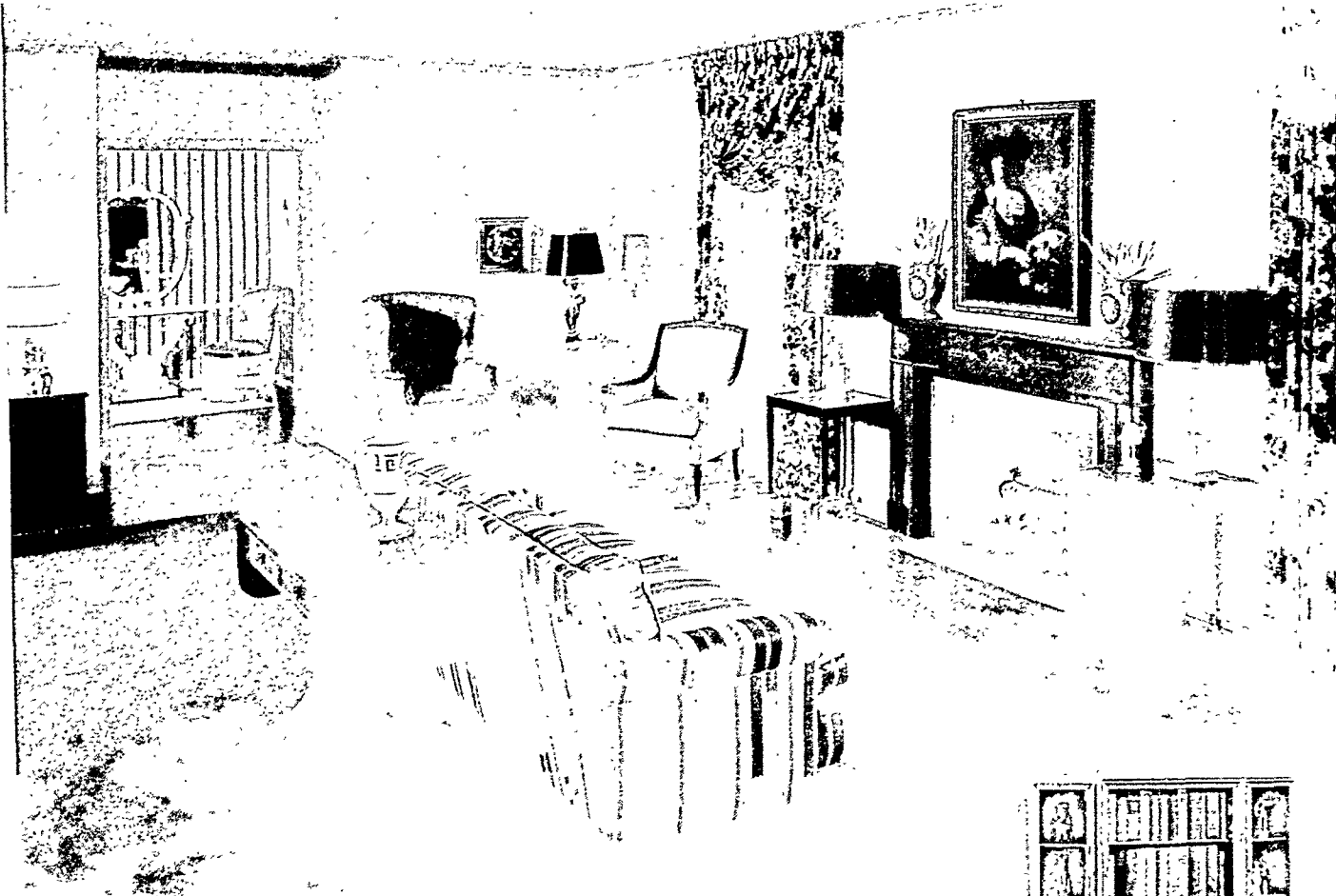
Inter-American Highway: see ROADS AND HIGHWAYS.

Interior Decoration. Outstanding events were the two World's Fairs. The one in New York, from a decorative standpoint, was disappointing. The scattered plan, the absence of adequate vistas, with a few exceptions, and the effort to be modern without sufficient understanding of underlying principles were regrettable and it seems unfortunate that the Town of Tomorrow, as someone said, "seemed to be designed by the architects of yesterday." The chief accomplishment was the dramatic and beautiful use of indirect and fantastic lighting and the successful use of sculpture as well as the sheer loveliness of the landscape planting. The American public suddenly became aware of colour in architecture and decoration. However, taken as a whole, there was a lack of distinction and real beauty.

But individual achievements stand out—the very real elegance of the Swedish pavilion, light, gay and in the happiest accord with the feeling of exhibition architecture—the lighting of the paintings in the Italian building—the Danish silver—the birch-log disc wall surface in the Finnish pavilion—and such sophisticated notes in the French pavilion as the brilliant green leather commodes tooled in gold against a white and gilt boiserie, the amusing ante-room, painted in trompe l'oeil to represent windows and cabinets filled with decorative objects, and the astounding execution of the red velvet architecture in the dressmakers' exhibit. At the San Francisco Fair, one remembers the beauty of the planting—not mere groups of flowers and shrubs, but a handling that displayed each separate plant-entity as brilliantly as though it were made of porcelain. The Industrial Arts Exhibit was delightful and the display in the American Indian building was handled with exquisite perfection and will probably be the forerunner to the use by decorators of Indian art. The lovely coloured backgrounds used for the display of the paintings in the art exhibit were a joy. Each picture shone, and the eye-tiring effect of the customary museum wall was absent. Another outstanding success was the Yerba Buena Club—the gilded exteriors with ramps in place of steps, the brilliant interiors with plaster furniture in metallic colours, the seashells worked into swags and decorations, the use of one colour against white for dramatic effect.

Looking back on domestic decoration in the popular field, one sees a heartening absence of the usual much-touted "trends." Are people at last refusing to be hypnotized by standardized "magazine taste"? It would seem that even though less money may be spent, ingenuity may give rooms that are lighter, fresher, and gayer, more individual—and consequently more interesting.

Another gratifying sign is the increasing conviction among business men that taste can sell a product. Ten years ago, it was not possible to decorate a hotel in any but a thoroughly vulgar fashion—a vast baronial lobby, a huge and echoing dining room, cramped and dreary bedrooms. Now fresh, lively colour can be used, together with amusing materials and furniture once considered impractical.



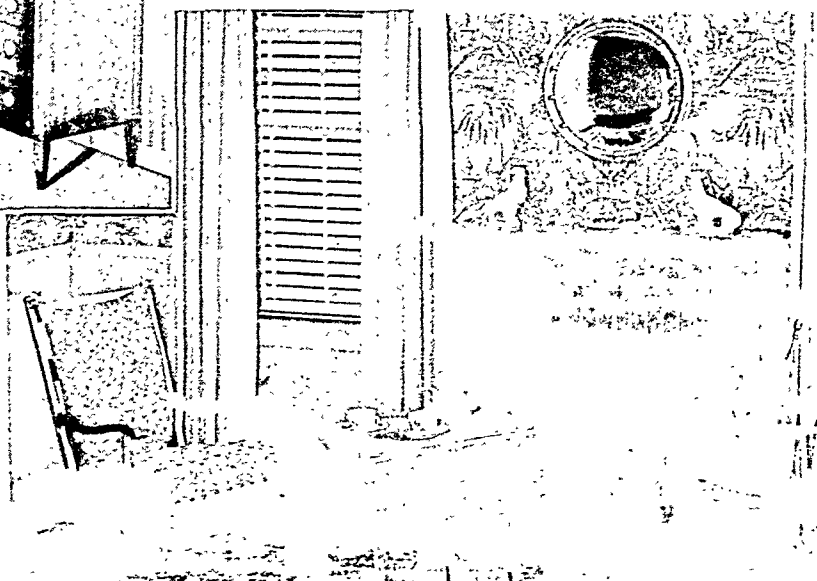
Above: EDWARDIAN DRAPERIES and a red-and-white Regency sofa featured a model "trend house" exhibited in 1939 at Chicago



ADAPTATIONS OF THE REGENCY MODE, with non-essential decorations stripped off, were featured in 1939



Right: "BREAK-FRONT" DESKS were conspicuous in 1939. Hardware was replaced in many modern pieces by grooved finger niches



Right: THE TEA WAGON returned to favour in 1939, for use also as an auxiliary table

Yet, notwithstanding these encouraging signs of change, one is still forced to acknowledge that all too often the designer's skill does not keep up with the scientist's invention. Among the new materials, for example, there is a crystal-clear, light, unbreakable and fireproof plastic. Instead of using it in a modern fashion, expensive chairs are being made of it . . . modelled after those of Victorian-cum-Baroque inspiration!

In 1939 increased emphasis was made on the living room as the centre of the house. Going back to the 18th century, the bed-chamber was all-important. In the Victorian age the dining room was featured. Today we have seen the rise of the private bar, the decorated bathroom and the "fun room," each as the mark of having arrived financially. Today, the big comfortable room, arranged for music, bridge or conversation takes the lead in any decorative scheme, particularly in circles where fashions begin. For once again people have begun truly to live in their houses, entertaining there in a manner that combines informality with good taste. The revival of that queer old-fashioned creature, "the lady," has been a pronounced influence—popularizing colour that is clear without being strident, forms that combine comfort with grace, and such amusing touches of fantasy as imaginatively designed hand-woven fabrics, Baroque plaster-work, Venetian blackamoors and candlelit chandeliers, in the same room with modern paintings.

(D. DR.)

International Labour Organization. The I.L.O. again in 1939 was the largest and most important "going concern" in international affairs. Despite the outbreak and spread of wars, declared and undeclared, in Europe and Asia, the I.L.O. gained in prestige, and promised greater usefulness in economic co-operation, in dealing with war-time labour problems, and in promotion of social justice as a basis of world peace.

The International Labour Conference, 25th session, June 8–28, Geneva, Switzerland, had 362 representatives present; 154 delegates—Governments, 86; employers, 34; and workers, 34, and adopted by a two-thirds vote 4 conventions, and 10 recommendations. The director's report noted membership decline due to war, and inability of some to pay dues, but increased demand for service which no other agency can render. "Twenty Years" since the First Conference (Washington, D.C., 1919) was the title of one section showing a record of marvellous achievement, the unique value of the tripartite principle basic in the I.L.O. structure whereby the representatives of Governments, employers and workers meet as equals for discussion and action on vital common interests of all.

Improvement of I.L.O. technique and widening of scope have given national labour legislation everywhere, and its application, a new meaning and practical universality undreamed of two decades ago. Through 67 conventions with 865 ratifications (Dec. 1939), solid foundations have been laid for an international labour code on work hours, freedom of association, women and child wage-earners, indigenous workers, maritime workers, social insurance, and other essentials of human welfare. In addition, recommendations adopted with equal care and deliberation help apply conventions or deal with matters not ripe for conventions. Finally the world's best research agency has made a good start in establishing an international civil service.

While war clouds were still afar, the governing body (I.L.O.) at its first meeting after Munich (London, Oct. 1938) set up an Emergency Committee (4 Government members, 2 employers, 2 workers) to make plans for I.L.O. work in war time, and to take over functions of the governing body if it became too difficult for full membership (32) to meet. Both emergency committee's and director's reports were debated at the 1939 conference by 60

delegates representing over 30 nationalities. Net result: enthusiastic, practically unanimous decision that I.L.O. must go on; the staff remain in Geneva as long as possible; war-time labour problems to be studied as a service of highest importance in preparation for eventual peace; normal services to neutrals continued and expanded despite financial difficulties.

Assurances of support from Governments were received from 31 member states by mid-October. Second Regional Conference of the Americas met in Havana, Cuba, in November. All American member states (16) joined in "Declaration of Havana" pledging "unwavering support" to I.L.O. More significant in both cases pledges were equally strong from employers, and even more so from workers.

Not only does the able and courageous leadership of the new American director, Governor Winant, in this difficult first year of his administration, and the fact that the centre of gravity of the I.L.O. is moving naturally westward, impose new duties on the U.S.A., but also they create new opportunities for service to humanity to which the strongest neutral and peace-loving nation in the world should not be slow to respond. (See also CHILD LABOUR; CHILD WELFARE; LEAGUE OF NATIONS; REFUGEES.)

(S. MCC. L.)

International Law. The outbreak of a new European war in 1939 at once raised inter-belligerent questions and belligerent-neutral questions. So far as concerns the belligerents, they appear to have started where they left off in 1918. In England, orders in council were issued seeking to prevent any cargoes from reaching Germany directly or indirectly, and imposing even an embargo on German exports, directly or indirectly. This could not be justified either under the law of blockade or contraband. There was no legal blockade, which requires ships, maritime or air, in close proximity to the port. The contraband lists were so far-reaching in their scope as hardly to admit of legality. Articles of distinctly military value may be included in such lists—not more. Otherwise the principle is broken down. The prohibition of trade to neutrals also has no authority. An embargo on exports has no legal authority. Only a lawful blockade could accomplish that. On the other hand, the German mining of the open seas with mines that became detached, was in violation of the Hague Conventions. So also was the unwarmed sinking as reported, of neutral vessels. On this topic, the facts are still somewhat unclear. Armed belligerent merchant vessels may be attacked without warning, and if some are armed a submarine may presume that all are armed. In the first weeks of the war, submarines appear to have stopped vessels for visit and permitted removal of passengers and crew when sinking was undertaken. This practice appears to have been suspended after the first few weeks.

For the United States, the most important event was the lifting of the arms embargo last established by the law of May 1, 1937. Much controversy preceded the step. It was argued by eminent lawyers that inasmuch as the motive was to enable the Allies to obtain arms and ammunition which in any event the Germans could not get and possibly might not want, the step was unneutral in motive and hence illegal for a neutral to undertake. On the other hand, it was argued that motives of a legislature cannot be questioned. The Senate report erroneously stated that the shipment of arms conformed to the practice of international law. International law permits a nation to pursue any policy that it chooses in this respect. Smaller neutrals have often declared arms embargoes. Other material changes in the Act of 1939 were the authorization to the President to declare combat areas from which American vessels were to be excluded, and the restoration of the cash-and-carry plan which had expired on May 1, 1939. By that

plan all American goods had to be transferred to foreign ownership before leaving the United States and cash had to be paid. No munitions could be carried by American vessels. Executive proclamations were issued from time to time to carry the Act into effect. Objections have been raised in various quarters to an unneutral administration of the Act. For example, complete bombing planes are being supplied to the Allied Governments. On the analogy of the prohibition of the supply of maritime warships, the legality of such supply has been said to be doubtful. It is prohibited by Article 46 of the Draft Convention on the Use of Radio and Aircraft in Time of War, adopted at The Hague, 1922. Merchant vessels armed with four six-inch guns are admitted to American ports as if they were peaceful vessels. The Havana Convention, Article 12, prohibited this, but the United States made a reservation, hence is not bound. The Panama Declaration of Oct. 1939, varied from the Havana Convention by permitting the admission of armed merchant ships provided they are armed for defence and at the stern only. The several countries of Latin America and the neutrals of Europe have indicated what they meant by "defence." Inasmuch as Secretary Lansing on Jan. 18, 1916, pointed out the impracticability of the distinction between offensive and defensive armaments in connection with submarine warfare, and as Holland refused to admit any armed ships to her ports, the distinction may not be sustainable.

In the Declaration of Panama and by diplomatic representations of the American countries, an effort was made to induce the belligerents to commit no belligerent act within an area around the American continents estimated as varying between 200 and 400 miles. Hostilities were to be kept out of what was called American waters. The case was pressed, especially after the engagement between the "Admiral Graf Spee," a German warship, and three British cruisers off Montevideo. The European belligerents have been loath to concede the claim, which does not strictly rest on legal grounds. There appears to be no immediate intention to enforce the claim.

The Russo-Finnish war broke out in Nov. 1939, but the Neutrality Act was not invoked because allegedly war had not been declared. Most wars are undeclared. A \$10,000,000 credit was set aside for Finland by the Export-Import Bank, and aircraft intended for the United States was released to Finland. A further Government loan is under discussion (Jan. 1, 1940). These aids to Finland have been challenged as unneutral.

Seizure of United States mails by the belligerents has been challenged by the United States as illegal under the Hague Convention, which exempts letter mail from search. The belligerent argument is that money and valuables may be concealed in the mail and that only opening it can determine content. The draftsmen of the Hague Convention were aware of that fact, and it appears that they intended letter mail to be immune. Parcel post, it has been admitted, may be examined for contraband.

The recognition or non-recognition of foreign conquests in the case of Albania, Czechoslovakia and Poland, all in 1939, presented problems for the Department of State. In Albania the American legation was closed, which may be evidence of recognition. In Czechoslovakia the legation was closed, the trade agreement with Czechoslovakia suspended, but this was explained as an admission of facts only, and not a *de jure* recognition of the legality of the occupation of Czechoslovakia. In the case of Poland, the Polish Government in Paris continued to be recognized as lawful, but it will probably be necessary to deal with the occupation as a *de facto* situation.

During the year, decisions of the Supreme Courts of Mexico and Bolivia failed to set aside the executive expropriation in Mexico or the executive cancellation of the oil concession in Bolivia. The Mexican decision of Dec. 2, 1939, was placed on the

ground that vast expropriations beyond the capacity of Mexico to pay for, are not covered by the literal requirements of Mexico's Constitution, but that deferred payments would satisfy the case and that if the payments cannot be made out of the proceeds of expropriated oil, then the companies would have a claim against the Government for the balance due. The court also held that the subsoil petroleum was not the property of the owners or lessees of the surface and that the abrogation of the exclusive right to extract it was not a taking of oil or of property. These contentions the United States has not admitted, and although Mexico contends that there is no denial of justice involved since the valuation of the surface properties is not yet completed, it is likely that the United States may take a different view.

In the case of Bolivia, the Supreme Court did not pass on the merits of the case but merely held that the company's representatives had improper powers of attorney and that the transfer of the concession from Richmond-Levering to the Standard Oil Company of Bolivia was invalid since it was not approved in advance by the Bolivian Government, but only ratified subsequently. This matter may be submitted to arbitration.

International law problems arising out of the Spanish Civil War concern mainly the effort of the successful Franco Government, recognized without difficulty as the Government of Spain, to reach property abroad held in the name of Spain or of the replaced Loyalist Government.

On July 26 the commercial treaty with Japan of 1911 was denounced by the United States, to take effect at the expiration of six months. Article 5 of this treaty was in conflict with the moral embargo declared by the American Executive on various types of war materials to Japan. The abrogation of the treaty was understood to clear the way for further acts of reprisal which could not then be charged as treaty breach. Whether embargoes or other reprisals will be undertaken is still an open question. It is part of the diplomatic contest between the United States and Japan.

The sabotage claims for the recovery of some \$50,000,000 for two explosions which occurred in 1916 and 1917 were decided in June 1939, by the American Commissioner and Umpire Roberts after the resignation of the German Commissioner. This decision undertook to reverse a unanimous decision arrived at in 1930 by a commission of two Americans and a German. Important questions of international law have been raised as to the power of the new commission to set aside the original award and the power of two commissioners to act in the absence of the third. Diplomatic protests have been entered and a court action begun. The matter is still pending.

On Feb. 17, 1939, the Dominican Republic paid Haiti \$275,000 in compromise settlement for the killing of Haitians by mob actions in 1937.

In the case of *Moscow Fire Insurance Company v. Bank of New York and Trust Co.*, 280 N.Y. 286, the United States Government intervened as assignee under the Litvinov agreement of 1933 of assets of the Soviet Government in this country. It was argued that the surplus assets of liquidated Russian corporations were the property of the Soviet, hence now of the United States. The New York Court of Appeals rejected this argument, declined to give effect in New York to a Russian confiscatory decree, and ordered that distribution of the surplus assets be made to foreign creditors and stockholders of the fire insurance company. The decision seems sound.

In the case of *Elg v. Perkins*, 307 U.S. 325, the United States Supreme Court held on May 29 that a child born in the United States of alien parents does not lose his American citizenship when the alien parents return to their native allegiance abroad, even when they take the child along, and that the child has until majority to elect whether to return to the United States to resume the

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duties of citizenship. In so concluding, the court reversed a ruling of the Department of State and in addition sustained a declaratory judgment against the Secretary of State that he may not refuse a passport on the ground that such a person is not in law a citizen. This establishes a new precedent to the effect that the Secretary's decision, heretofore unreviewable in the matter of passports, may be reviewed by declaratory action if the refusal is based on a legal ground. (See also NEUTRALITY; PACIFISM.)

(E. BD.)

International Peace Campaign: see PACIFISM.

International Trade. The history of world trade in the years 1937-39 clearly illustrates the growing interdependence of nations as well as the leading roles of the United States and the United Kingdom in world economy. The United States consumes a larger proportion of the world's raw materials than any other country, probably as much as 40% of the total, while the United Kingdom is the greatest importer of foodstuffs and likewise imports large quantities of raw materials, and their combined purchases abroad exert a stimulating influence on the economy of other nations.

The remarkable progress of economic recovery in the United States and the United Kingdom, which began in 1935 and continued well into the autumn of 1937, and the resulting intense industrial and commercial activity brought the volume of international trade in 1937 very near the high levels of 1928 and 1929, although the monetary value of the trade was about the same as 30 years ago when prices were much higher. The aggregate trade of 109 countries, imports and exports combined, had a value in 1937 of about 31,153,000,000 gold dollars, an increase of 23.5% over 1936, due partly to higher prices, but in a greater measure to a larger volume of trade.

The decline in industrial production which ensued late in 1937 depressed the prices of raw materials and reduced the volume of trade. Trade was affected adversely also by the war in Spain and China, and the war scares in Central Europe where old-

Table I.—Foreign Trade of 40 Countries
For the first 7 months of 1938 and 1939 (in millions)

	1938	1939
United Kingdom £	851	834
United States \$	2,020	2,009
Germany marks	6,987	6,509
France francs	43,028	49,617
Japan yen	3,016	3,488
Belgium francs	25,469	25,552
Canada \$	843	858
Netherlands florins	1,306	1,470
India rupees	1,868	2,028
Italy lire	12,872	12,042
Sweden crowns	2,164	2,410
Argentina pesos	1,682	1,662
Australia £	126	110
Switzerland francs	1,603	1,806
Manchoukuo yuan	1,085	1,454
Denmark crowns	1,803	1,856
British Malaya S. S. \$	660	707
Dutch East Indies florins	671	676
Union of S. Africa £ (SA)	74	74
Brazil milreis	6,059	6,159
China yuan	917	2,259
Czecho-Slovakia crowns	12,012	8,626
Poland zlotys	1,422	1,544
Norway crowns	1,700	1,165
Rumania lei	22,875	29,204
Finland markkas	9,161	9,419
Egypt £ E	37	38
Eire £	36	38
Hungary pengos	525	614
Burma rupees	434	477
Philippines pesos	326	271
Yugoslavia dinars	5,710	5,784
Chile pesos	700	618
Ceylon rupees	303	315
Greece drachmas	13,447	12,578
Portugal escudos	1,772	1,742
Peru soles	322	354
Bulgaria leva	5,536	5,221
Palestine £	10	13
Latvia lats	247	281
Total gold \$	13,918	13,578

Table II.—Foreign Trade of 23 Countries
For the first 9 months of 1938 and 1939 (in millions)

	1938	1939
United Kingdom £	1,084	1,031
United States \$	3,730	3,805
Japan yen	3,860	4,015
Canada \$	1,098	1,151
Belgium francs	32,664	31,543
Netherlands florins	1,810	1,861
India rupees	2,383	2,601
Sweden crowns	2,820	3,122
Argentina pesos	2,139	2,129
Australia £	157	138
Denmark crowns	2,344	2,433
Switzerland francs	2,096	2,217
British Malaya S. S. \$	849	929
New Zealand £ (NZ)	89	100
Norway crowns	1,441	1,466
Hungary pengos	692	786
Turkey £ T	101	154
Ceylon rupees	392	406
Greece drachmas	16,724	15,590
Portugal escudos	2,272	2,352
Bulgaria leva	7,022	6,894
Estonia crowns	158	109
Iceland crowns	76	84
Total gold \$	11,548	11,253

established trade connections were disrupted by the annexation of Austria to Germany, the dismemberment of Czecho-Slovakia, and the forced liquidation of many Jewish firms, both industrial and commercial. The aggregate value of world trade in 1938, approximately 27,072,000,000 gold dollars, was 13.1% below the total for 1937.

The year 1939 was a war year. Every day throughout the year potential producers and consumers were being killed somewhere in Europe or Asia, and wealth destroyed to make an impoverished world still poorer. The absorption by Germany of Austria, Czecho-Slovakia, and the invasion and partition of Poland reduced their share in world trade heretofore amounting nearly to 4% of the total. After the occupation of Bohemia and Moravia by the German Army in March some of the foreign orders for Bohemian glass and linen goods were diverted to Belgium, but many others were simply cancelled. Exact data on international trade in 1939 will probably never be known, as trade statistics are one of the casualties of the war. Germany and Italy stopped publication after the issue of the July summaries, and the Soviet Union did not issue a report on 1939 trade. However, on the basis of the data available it may be estimated that the total value of world trade in 1939 will not exceed 26,400,000,000 gold dollars, though its volume may be slightly larger than in 1938.

This estimate is based on the figures presented in the tables herewith. Table I shows the value of the trade of 40 countries for the first seven months of 1938 and 1939. The countries are ranged in descending order according to the gold value of their foreign trade, imports and exports combined. The total in millions of the old United States gold dollars has been obtained by converting the amounts in original currencies at average rates of exchange. Of the countries listed, 17 show increases in 1939 while 23 show decreases; in 11 cases, however, the changes are small. The aggregate trade of the 40 countries shows a decline of \$340,013,000, gold, or 2.36%. As the prices prevailing in the first half of 1939 were about 8% below the prices of the first half of 1938, it is evident that the volume of trade was about 6% larger in 1939. The total decline in value was more than accounted for by the decreases in the trade of the United Kingdom, Germany, Czecho-Slovakia, and Australia.

Table II shows the trade of 23 countries for the first nine months of 1938 and 1939. The aggregate gold value of the foreign trade of these countries was \$11,252,994,000 in 1939, as against \$11,548,007,000 in 1938, a decrease of 2.56%. Of the countries listed, 11 show a gain of \$227,508,000, gold, in 1939, the principal gainers, in absolute figures, being Japan, the United States, the Netherlands, Canada, Sweden, and Hungary. Only in the cases

of Hungary and Japan, however, did the gain exceed 10%; in all other cases the relative increase was less than 5%. The other 12 countries show a reduction in the total value of their foreign trade of \$522,521,000, gold, the principal losers, in absolute figures, being the United Kingdom, Australia, Argentina, Belgium and Greece. In the cases of Australia, Greece and the United Kingdom the decline was in excess of 10%; the trade of Argentina decreased 6.8%; in all other cases the loss was less than 5%. The total net loss was \$295,013,000.

The trade figures shown in Table I and Table II appear to warrant the conclusion that the value of world trade in 1939 will be about 2.5% below the total for 1938. The war in Europe may stimulate the demand for war materials in the last quarter of the year but at the same time it may reduce the consumption of other goods in the belligerent countries since they may be constrained to use a much larger proportion of the national savings to pay for the war. It is interesting to note that international trade declined in Sept. 1939 although—or because—the prices of many leading commodities increased sharply in that month after the German armies had invaded Poland, and the United Kingdom and France declared war on Germany. Lard, wheat, maize, rice, sugar, coffee, tea, cacao beans, hides, rubber, cotton, jute, wool, silk, copper, tin, lead and zinc, all were quoted higher on the free markets in September. In view of the great value of international trade in promoting the welfare of nations it is rather discouraging to see the attempts of so many countries to reduce or destroy the benefits of the international division of labour and exchange of goods by high taxes, quotas, foreign-exchange restrictions, direct prohibitions and other means. The international monetary and trading mechanism has been disrupted, and international co-operation abandoned in a world crisis when such co-operation appears to be more necessary than ever. The United States alone is making consistent efforts to lower trade barriers by reciprocal trade agreements with concessions applicable to all countries not discriminating against the signatories. In many countries "economic nationalism" is rampant; it involves attempts to make countries self-sufficient by using home-made substitutes in the place of imported products. It is a sort of military economy, as it seeks to husband domestic resources for the purposes of war.



"MEN WILL BE BOYS." A cartoon comment by Thomas of *The Detroit News* upon the United States' announcement April 24, 1939, that it would barter products with Great Britain, Belgium, and The Netherlands

In most cases the substitute articles are not only of lower quality but also costlier than the genuine products; in normal times they would be classed as adulterated merchandise, and their sale prohibited. But the times are not normal when the garrison states openly proclaim their plans to conquer the world, and their regimented economy disturbs and reduces the natural flow of trade. It may take a generation before relative freedom in the international exchange of goods is restored. (See also EXPORTS AND IMPORTS.) (J. J. K.)

Interstate Commerce Commission: see GOVERNMENT DEPARTMENTS AND BUREAUS; RAILROADS.

Intoxication, Alcoholic. Medical literature during the twelve-months' period ending Sept. 30, 1939, dealing with alcoholic intoxication, concerned itself largely with the subject of chronic alcoholism. However, the wider use of chemical laboratory techniques in the diagnosis of acute alcoholism incident to the enforcement of automobile traffic regulations resulted in an increased literature on that phase of the subject.

The latter tended in the direction of bringing about greater uniformity in diagnostic criteria and improvements in the technique of assembling and presenting admissible evidence in a court of law. In general there has been a greater tendency for courts to admit, as evidence, the results of chemical tests of the blood and urine used in the diagnosis of acute alcoholism. Of greater significance, however, is the increasing trend of "pleas of guilty" to charges of "drunken driving" when the alleged offender is confronted with the results of chemical tests. The generally accepted rates of alcohol concentration in the blood and in the urine is as 1 is to 1.35. Blood concentration may exceed that of the urine if the tests are made within two hours subsequent to drinking. At the end of that period, alcohol in the body tissues and fluids tends to reach an equilibrium, the accepted elimination rate being 20 milligrams per hour thereafter.

However, it is generally conceded that the action of alcohol upon man is dependent upon a variety of factors and that differences in reactions obtain in different individuals and in the same individual at different times. In consequence there is some difference in opinion as to what constitutes "acute alcoholism" from the standpoint of alcohol concentration in body fluids. In general, blood concentration of 0.20% alcohol correlates with clinical evidence of acute intoxication, whereas 0.1 percents are borderline.

Experimental evidence has indicated that insulin is necessary for the oxidation of alcohol within the body. Its clinical use, combined with dextrose intravenously, tends to increase the rate of disappearance of alcohol from the blood.

There are indications that chronic alcoholism is being regarded, more and more, as a medical problem, through the wider use of hospitals and institutions ministering to the sick as shown by the increased admission rate of alcoholics. Moreover a recent court decision established a precedent by a ruling that chronic alcoholism is not a self-inflicted disability, but a disease.

Differences of opinion have obtained since 1928 when, on theoretical grounds, vitamin deficiency was first mentioned in the literature as an etiological factor in alcoholic neuritis. This conception has been substantiated not only with reference to neuritis but with reference to other physical and mental phenomena associated with chronic alcoholism. Afflictions such as polyneuritis, pellagra and other deficiency syndromes proximal to alcoholism are the results of a deficiency in the vitamin B complex. This is in part the result of an inadequate intake. The cevitic acid content of the blood in some alcoholic psychoses has been reported as low as that seen in subclinical scurvy.

The trend in the direction of the biochemical approach toward a better understanding of the nature of the physical disorders associated with chronic alcoholism influenced the management and treatment of delirium tremens and the polyneuritic complications, including cardiovascular and other disturbances seen in the chronic habitué. Thus, delirium tremens is characterized by dehydration, diminished blood chlorides, acidosis and by either a definite or partial multiple vitamin deficiency involving mainly the vitamin B complex, treatment being directed toward the correction of these adverse conditions.

The treatment of polyneuritis and other physical complications of alcoholism has centred about the use and value of vitamin B alone (Theamin) or in combination with a diet rich in vitamin content or with the use of the latter alone.

In general the literature on chronic alcoholism, as in previous years, was concerned with the need for a more adequate public policy for the protection of the general public and the protection and rehabilitation or reclamation of those addicted. No new principles were evolved, however.

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Inventions: see PATENTS.

Iodine. Chile, formerly the producer of almost the entire world supply of iodine (a by-product in the treatment of caliche for the recovery of sodium nitrate), now has active competition in the market from the United States, Java, and Japan, and small amounts for local consumption are produced in Italy. The Italian output is of the order of 25-30 metric tons and the Javanese 100 tons annually; that of the United States was 135 tons in 1937, increasing in 1938; Japan produced 48 tons in 1937. Chile is still the main source of supply, with an output that ranged from 500 to 1,000 tons before active competition began in other countries; sales in the fiscal year 1937-38 were 832 tons. Outside competition reduced the price to 81 cents per pound in 1936, rising in 1938 to \$1.02. (G. A. Ro.)

Iowa, north-central State of the United States, popularly known as the "Hawkeye State"; area 56,147 sq.mi.; population (U.S. census, 1930) 2,470,939; (estimate for 1938) 2,561,000. Capital, Des Moines, 142,559, the only city in Iowa with a population over 100,000. Of the State's population in 1930, 979,292 were urban or 39.6%; 2,448,382 whites; 22,557 coloured; 2,282,647 native born whites; 165,735 foreign born whites.

History.—The officers elected on Nov. 8, 1938, who took office in Jan. 1939, are: governor, George A. Wilson; lieutenant-governor, B. B. Hickenlooper; auditor, C. B. Akers; treasurer, W. G. C. Bagley; secretary of State, Earl G. Miller; secretary of agriculture, Mark G. Thornburg; attorney-general, Fred. D. Everett; and superintendent of public instruction, Jessie M. Parker. All are Republicans. A State conservation commission, a State board of social welfare, a State commerce commission, a State planning board, and an Iowa unemployment compensation commission were created or reorganized by the General Assembly in 1937, but the planning board was abolished in 1939. The State highway commission is located at Ames, Iowa; all the other boards and commissions have their headquarters at Des Moines. Funds for the State are provided by taxes on property, incomes,

retail sales, corporations, gasoline (State tax 3¢ per gal.), and inheritances. There are limited exemptions on homesteads. By July 1, 1939, 5,134.9mi. of primary roads of Iowa were paved and 3,275mi. were gravelled or otherwise surfaced. Of the secondary road system, 35,586.26mi. were gravelled and 26.5mi. were paved. Highway construction on primary roads in 1938 cost \$12,979,376. From Dec. 1, 1938 to June 30, 1939, construction costs on primary roads amounted to \$4,275,210.23. The State highway patrol has a staff of 103 men.

Education.—The superintendent of public instruction reports for the school year, 1937-38, 8,761 rural schools in Iowa, 1,701 graded schools, and 945 approved high schools. The total number of children of school age (5-21 years) was 681,169. Of these 519,150 were enrolled in the public schools, and 1,880 in public junior colleges. The teachers in the public schools, exclusive of junior colleges, numbered 25,065; and the cost of the public schools for 1937-38 was \$41,296,626.01, raised largely by the general property tax in local districts. For the school year 1938-39 the total attendance at the three State-supported institutions of higher education under the State board of education (the State university at Iowa City, the State College of Agriculture and Mechanic Arts at Ames, and the State Teachers college at Cedar Falls) was 21,861, with over 35,000 in addition attending short courses and conferences at Iowa City and Ames. There are also some 20 privately supported colleges in the State. Iowa ranks first among the States in literacy with only .8 of 1% illiterate.

Charities.—A State board of social welfare, composed of three members appointed by the governor (King R. Palmer, chairman), administers old age assistance, aid to the blind, aid to dependent children, child welfare, and emergency relief. Working with it are local boards in the 99 counties. The board of control (D. R. McCreery, chairman) has charge of the State's penal, correctional, and eleemosynary institutions. Statistics for these as of Nov. 30, 1939, were as follows: Men's Reformatory, Anamosa, 1,129; State Penitentiary, Fort Madison, 1,455; Women's Reformatory, Rockwell City, 81; Training School for Boys, Eldora, 594; Training School for Girls, Mitchellville, 111; State Juvenile Home, Toledo, 274; and Soldiers' Orphans' Home, Davenport, 535. The four State hospitals for the insane had 6,462 inmates.

Banking and Business.—There were 108 national banks, 296 savings banks, 239 State banks, and 3 trust companies doing business in Iowa in 1939. On June 30, 1939, the 538 State institutions had total deposits of \$401,323,567.84, an increase of \$25,447,464.84 over those of the previous year. At the same time the deposits in the national banks totalled \$236,730,000. Approximately 80% of the deposits in State banks and 58% of those in national banks were protected by Government insurance. Farm prices through Oct. 1939, decreased 9.2% from those for the same period of 1938, but farm income (through October) increased 13.6%.

Electric power production for the first nine months of 1939 showed an increase of 1.9% over the same period of 1938. Building contracts in general increased 5.7%, and residence building showed an increase of 28.8%, but business building contracts showed a decrease of 3.4%. Life insurance sales increased 7%, department store sales, 2.3%, employment 2.8%, industrial pay-rolls 6.5%, automobile sales 31.1%, and bank debits 6.5%.

Agriculture.—There were 209,709 farms in Iowa in 1939 with

	Acres	Total Production	Total Value
Corn	9,688,000	503,776,000 bu.	\$267,001,000
Oats	5,076,000	154,818,000 bu.	41,801,000
Hay (all kinds)	3,633,000	5,098,000 tons	27,640,000
Wheat	390,000	6,490,000 bu.	4,218,000
Barley	563,000	13,794,000 bu.	5,242,000
Rye	72,000	1,044,000 bu.	305,000
Potatoes	56,000	5,600,000 bu.	4,200,000
Soybeans (for beans)	487,000	10,227,000 bu.	7,670,000
Soybeans (for hay)	626,000	939,000 tons	5,250,000

34,402,853 ac. of land. Slightly more than 57% of this land was farmed by tenants. Crops in Iowa were unusually good in 1939. The figures on the preceding page indicate the production and value of the principal crops for 1939 as reported at the close of October. On Jan. 1, 1939, there were 8,179,000 hogs on Iowa farms, 1,710,000 sheep, 4,465,000 cattle, 783,000 horses and 55,000 mules. During 1938 Iowa farmers marketed 9,612,000 hogs, 1,903,500 cattle, 305,600 calves, and 1,440,600 sheep and lambs.

The total cash income of Iowa farmers for Jan.-Oct., 1939 was \$487,112,000, as compared with \$576,744,000 for the entire year 1938, \$522,356,000 for 1937, \$569,000,000 for 1936, and \$528,495,000 for 1935. Of the income for the first ten months of 1939, approximately \$353,570,000 came from livestock and livestock products, \$95,008,000 from crops, and \$38,534,000 from Government payments. On Jan. 1, 1939, there were 197,556 automobiles, 19,779 auto trucks, and 110,831 tractors owned on Iowa farms. Farm-owned radios numbered 150,887. Some 49,000 farms were electrified.

(B. F. S.)

Iowa, State University of. First State university to admit women on equal standing with men, it is located in Iowa City, a community of 17,000 persons 55 mi. west of the Mississippi river. Iowa's first general assembly established the university Feb. 25, 1847.

Enrolment in 1939 for the fourth time passed the 10,000-mark, although the figure of 10,336 for the 12 months ending in June was short of the record established two years before. The university granted the second-greatest number of degrees in its history, 1,730, of which 650 were advanced awards.

Demand for additional dormitory space resulted in the completion of an addition to Hillcrest, men's dormitory, to accommodate 222 men, and to Currier Hall, to house some 200 additional women. The \$90,000 radio studio building was completed. Some \$40,000 was received in gifts and grants, mainly for scientific research. More than half of the amount was for research in medical fields. In the nine colleges and five schools, a staff of 525 persons gave instruction. Two heads of departments were included in the ten major changes in faculty personnel above the rank of instructor.

Iowa State College. Iowa's land-grant institution at Ames during 1939 made marked progress in a number of its facilities for research and instruction in agriculture, engineering, home economics, science and veterinary medicine. The Iowa State College Agricultural Foundation was established to study the operation of family-size farms through the gift of 1,750 ac. of Iowa farm land and \$100,000. Several new buildings and structures were completed, including two dormitories for women and one for men, a veterinary medicine clinic and an addition to the Memorial Union. The college radio station WOI was provided with new studios, new transmitter and a 400 ft. antenna. An Iowa State College Press was formed to provide an imprint for technical books in the fields peculiar to the college. Work in statistics as a tool for research workers was brought to the highest state it has attained in the years of its development as a separate department. In the year ending in June 1939, resident enrolment in Iowa State college reached a new high of 7,677 students, including 2,288 women and 1,101 graduate students.

(R. W. BE.)

Iran, area 634,360 sq. mi.; pop. (est. Dec. 31, 1937) 15,000,000. Chief towns: Teheran (cap., 360,000), Tabriz (220,000), Meshed (140,000), Shiraz (120,000), Isfahan (100,000). Ruler, Reza Pahlevi Shah; language, Persian; religion, Mohammedan.

History.—On Feb. 21, 1939 diplomatic relations with France

were resumed: the break had lasted since Dec. 28, 1938 and had been caused by references in the French press to the Shah which were regarded in Iran as insulting. The marriage of the Crown Prince, H. H. Shahpur Mohammed Reza, to Princess Fawzieh, sister of King Farouk of Egypt, was celebrated on March 15 in accordance with Moslem usage at the Abdin Palace in Cairo. On September 5 the Government announced that Iran would remain neutral, and would defend her neutrality. On the Government's resignation on October 27, the Shah appointed Dr. Matin-Daftari, formerly minister of justice, to be prime minister.

Banking and Finance.—Revenue, ordinary, (est. 1938–39) 1,528,400,000 rials; (est. 1939–40) 1,930,096,000 rials; expenditure, ordinary, (est. 1938–39) 1,527,500,000 rials; (est. 1939–40) 2,613,482,000 rials; foreign loan (May 15, 1939) £991,120; public debt (Dec. 31, 1938) 98,900,000 rials; note circulation (May 31, 1939) 856,000,000 rials; gold reserve (May 22, 1939) 310,949,000 rials; exchange rate rials 80.50 = £1 sterling.

Trade and Communication.—Foreign trade (merchandise) 1937–38: imports 1,394,878,000 rials; exports 2,559,881,000 rials. Communications 1938: roads fit for wheeled traffic c. 8,700 mi.; railways open to traffic 1,072 miles.

Agriculture and Minerals.—Production, 1936–37 (metric tons): petroleum, crude (1938) 10,359,000; wheat 2,159,560; barley 882,564; rice 398,510; beetroot 135,940; cotton 122,480; wool 12,963; beet sugar (1937–38) 26,100; tobacco (1937–38) 15,900.

Iraq, area 116,000 sq. mi.; pop. (est. Dec. 31, 1938) 5,000,000. Chief towns (pop. est. 1938): Baghdad (capital 400,000); Mosul (260,000); Basrah (180,000). Ruler: King Feisal II; regent: Prince Abdul Ilah; premier: General Nuri-Es-Saud; language: Arabic; religion: Mohammedan.

History.—Early in January the prime minister broadcast a plea for more truly democratic government with an effective parliamentary opposition, freedom of the press, and a reformed electoral law. On March 7 Seyyid Hikmat Sulaiman, prime minister after the military coup d'état of Oct. 1936, was arrested on a charge of plotting to overthrow the Government and to place the king's uncle, the Emir Zaid, on the throne. It was not thought that the emir was privy to the plot. Martial law was enforced at the Army headquarters near Baghdad and its neighbourhood. On April 4 King Ghazi was killed in a motor accident in Baghdad, and his three-year-old son was proclaimed king as Feisal II, under the regency of his maternal uncle, the Emir Abdul Ilah. On the same day, a mob, under the impression that the British were responsible for the king's death, murdered the British consul at Mosul, G. Monck-Mason. The death sentence passed on a 17-year old student for this crime was later commuted to 15 years' imprisonment. On May 18 Seyyid Ali Jowdat el-Ayubi became foreign minister, while the prime minister himself took over the ministry of the interior. On May 31 the Iraq Petroleum Company agreed to advance the Government £3,000,000 in return for modifications in the drilling schedule imposed by the Government on the British Oil Development Company.

According to a statement broadcast by the prime minister on March 30, Iraq's foreign policy was based first on alliance with Great Britain, and secondly on alliance with neighbouring Arab States and friendship with Iran and Turkey. In fulfilment of this policy, on September 6, diplomatic relations with Germany were severed, and all Germans were deported from Iraq. (E. A. ASH.)

Education.—In 1938: elementary schools, Government, 741; scholars, 94,368; new schools opened 1938–39, 22; secondary schools, 14; scholars, 1,904; intermediate schools, 48; scholars, 10,611.

Banking and Finance.—Revenue, ordinary (actual 1938–39),



FEISAL II, 3 years old, became king of Iraq Apr. 4, 1939, when his father, Ghazi I, was killed in a motor car accident

5,686,050 dinars; (est. 1939-40) 6,033,000 dinars; expenditure, ordinary (actual 1938-39), 5,493,265 dinars; (est. 1939-40) 5,994,632 dinars; public debt (Dec. 31, 1938), 1,000,000 dinars; notes in circulation (June 30, 1939) 4,200,000 dinars; foreign assets reserves (sterling), £4,600,000 sterling; exchange rate (currency based on sterling): 1 dinar=£1 sterling.

Trade and Communication.—Foreign trade 1938 (merchandise): imports, 9,361,004 dinars; exports, domestic, 3,472,369 dinars; foreign produce, 216,466 dinars. Communications 1939: roads, main routes, 3,130mi.; railways, open to traffic, 752 miles.

Agriculture and Minerals.—Production 1938 (in metric tons): petroleum, crude, 4,272,000; wheat, 600,000; rice, 360,000; barley (1937), 570,000; tobacco, 4,000; wool (1937), 7,200; cotton, 2,900. (W. H. WN.)

Ireland, Northern. Area 5,238 sq.mi.; pop. (June 30, 1938) 1,285,000. Chief towns (pop. census 1937) Belfast (438,086); Londonderry (47,813). Governor: the Duke of Abercorn; language: English; religion: Christian (Roman Catholic, 33.75%; Presbyterian, 31.4%; Episcopalian, 27%).

History.—The earlier part of the year 1939 was marked by continued resistance to Eire's partition-ending propaganda, and in March Ulster's expressed "unalterable determination to maintain Northern Ireland's allegiance to the Crown as an integral part of the United Kingdom" was answered by Sir Samuel Hoare's reiterated assurance of no coercion into an "all-Ireland union." In the same month the Government opened a London office at 21 Cockspur street, passenger railway fares were advanced by 5%, and it was announced that £100,000 extra had been allotted for combatting I. R. A. (Irish Republican Army) outrages. The budget of May recorded a loss of over £3,000,000 in connection with the new road-transport schemes and imposed increased motor taxation, but by October war had made an emergency budget necessary. This doubled Ulster's original contribution of £1,000,000 to Imperial Services to £2,000,000 during the first months of the war, and by additional taxation increased the reserved revenue

by £1,240,000 over the previous budget estimate. By taking similar economic measures to those taken in Great Britain (e. g., the raising of estate duties) it was ensured that excess war expenditure should fall on the Imperial, and not on the Northern Ireland exchequer.

Ulster's anxiety to play her part in any difficulty in which the Empire might find itself was clearly shown at the end of April, when Lord Craigavon informed the British Government that she "as the most loyal part of the United Kingdom would deeply resent omission from the Military Training Bill"; but Mr. Chamberlain in the House of Commons (May 4), while warmly welcoming this attitude, decided that it would not be politic to extend the bill to Northern Ireland.

Unemployment showed a marked decline during 1939, the figures at the half-year being the lowest for 19 months. (L. H. D.)

Education.—In 1938: elementary schools 1,700; scholars 191,862; secondary schools 76; scholars 14,557; universities, students 1,590.

Banking and Finance.—Revenue (1938-39) £16,295,306; expenditure (1938-39) £15,245,853.

Trade and Communication.—External trade 1938: imports, £54,385,000; exports, £51,061,000. Communications 1938: roads fit for motor traffic, 13,008mi.; railways, standard gauge 633mi.; narrow 121.

Agriculture and Manufactures.—Production 1938: in tons, potatoes 491,000; oats 22,700; wheat 3,850; flax (1937) 4,187; barley 1,025; cattle 731,930 head; sheep 893,431 head; pigs 810,312 head; poultry, number 10,193,038; shipbuilding, tonnage launched 79,468; value of linen goods exported 1938, £5,480,000.

Irish Free State: see EIRE.

Iron and Steel. Discussion of the iron and steel industry can for the most part be handled more satisfactorily subdivided into its three main headings—iron ore, pig iron, and steel. Production tables under each of these headings include all countries in which production of the commodity in question has exceeded 1,000,000 tons. This coverage in general accounts for 93-98% of the totals.

Iron Ore.—World production of iron ore decreased 64% from the 1929 high to the 1932 low, and recovered to 107% of the 1929

World Production of Iron Ore
(In millions of long tons)

	1929	1932	1936	1937	1938
North America—					
Newfoundland	1.5	0.1	0.7	1.6	1.7
United States	73.0	9.8	48.8	72.1	28.3
South America—					
Chile	1.8	0.2	1.3	1.5	1.6
Europe—					
Austria	1.9	0.3	1.0	1.9	...
Czecho-Slovakia	1.8	0.6	1.1	1.8	...
France	49.9	27.2	32.7	37.3	32.6
Germany	6.3	1.3	7.5	7.7	11.0
Luxemburg	7.5	3.2	4.8	7.6	5.0
Spain	6.4	1.7	2.0	0.7	2.5
Sweden	11.3	3.2	11.1	14.7	13.7
U.S.S.R.	6.9	12.0	29.3	27.6	27.0
United Kingdom	13.2	7.3	12.7	14.2	11.8
Asia—					
China	2.6	2.2	?	?	?
India	2.4	1.8	2.5	2.9	2.8
Malaya	0.8	0.7	1.7	1.7	1.7
Africa—					
Algeria	2.2	0.5	2.1	2.3	3.0
Morocco (Span.)	1.2	0.2	1.1	1.4	1.3
Australia	0.9	0.6	1.9	1.9	2.3
World Total	200.0	75.0	170.0	214.0	161.0
Ex. U.S.A.	127.0	65.2	121.2	142.0	132.7
Ex. British	191.1	64.3	149.5	191.6	139.2
Brit. Empire	18.9	10.7	20.5	23.4	21.8

level in 1937. Three countries, the United States, France, and the Soviet Union, contribute nearly two-thirds of the total, while the other two of the leading iron and steel producers, the United Kingdom and Germany, add another 10%. Production declined sharply in 1938, mostly in the United States, but regained most of the loss in 1939. The United States output for 1939 rose to 51,830,000 long tons.

The industry in the United States and the Soviet Union is practically self-contained, but Germany produces only about one-third of her requirements, and imports two-thirds, while the United Kingdom produces about two-thirds and imports one-third. Sweden exports almost her entire output, mainly to Germany, and about one-half of the French output is exported to Belgium and Germany.

Pig Iron.—World production of pig iron increased by 25% in 1939, to 102,400,000 metric tons, all of the major countries showing improvement over 1938. Part of the increase listed for Germany was due to the annexation of Czecho-Slovakia and Poland. The outputs of Germany, Japan and Italy in 1938 were new high records as was also the world total, by a small margin.

In all, exports and imports of pig iron are so small as to involve only comparatively small percentages of the output, but in some cases, considerable amounts of scrap metal are imported, to take the place of pig iron in the production of steel.

Steel.—World steel production in 1939 rose by 24%, a slightly lower figure than with pig iron, to a total of 133,200,000 tons; there were no material decreases in output. Contrary to expectation the Soviet Union failed to make a gain, but all other major producers and most of the minors did so.

The United States steel industry is practically independent of imports, and exports amount to only about 7% of the production. Among the European producers international trade plays a much larger part in the industry, except for the Soviet Union, in which exports are small, and imports run about 4%. The United Kingdom has steel imports of about 12% and exports of 19% of production, leaving a net export of 7%. Germany imports 3% and exports 19%, or a net export of 16%. France imports 2% and exports 33%, making a net export of 31%. The Economic Union of Belgium and Luxemburg are still heavier exporters, sending out 44% of the combined output. Incidentally, these European percentages, though still fairly large, have been decreased by about one-half during the past decade by export and import restrictions and embargos that have been put into effect in these and other countries to which exports were formerly made.

Europe.—The trend of events during 1938 and 1939 has made some marked changes in the steel industry of Europe. First the Austrian *anschluss* brought to Germany a steel output of about

World Production of Steel
(In millions of long tons)

	1929	1932	1937	1938	1939
North America—					
Canada	1.4	0.3	1.4	1.1	1.3
United States . .	56.4	13.7	50.6	28.3	46.9
Europe—					
Belgium	4.0	2.7	3.8	2.2	2.9
Czecho-Slovakia .	2.2	0.7	2.3	1.7	0.4
France	11.7	6.9	7.8	6.1	8.4
Germany	16.0	5.7	19.5	22.9	24.2
Italy	2.1	1.4	2.1	2.3	2.3
Luxemburg . . .	2.7	1.9	2.5	1.4	1.7
Poland	1.4	0.5	1.4	1.5	1.4
Sweden	0.7	0.5	1.1	1.0	1.1
U.S.S.R. . . .	4.6	5.7	17.5	18.2	18.0
United Kingdom .	9.6	5.3	13.0	10.4	13.5
Asia—					
Japan	2.3	2.4	5.7	5.9	6.3
World Total . .	118.1	49.9	132.5	107.1	133.2
Ex. U.S.A. . .	61.7	36.2	81.9	78.8	86.3
Ex. British . .	106.1	6.4	116.2	93.0	115.9
Brit. Empire . .	12.0	43.5	16.3	14.1	17.3

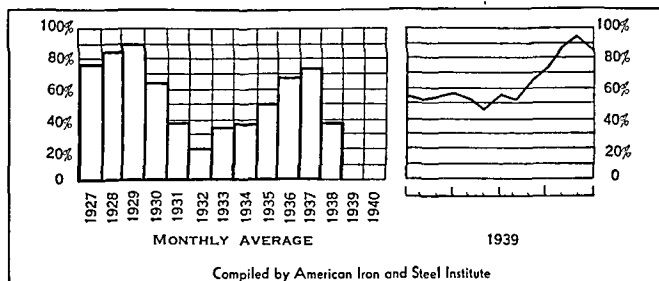
640,000 tons; another 350,000 tons was acquired with the Sudetenland, while another 750,000 tons of the Czech output went to Poland. Then the absorption of Bohemia and Moravia brought the remaining 1,200,000 tons of Czech output to Germany, and finally the conquest of Poland added the former Polish output of 1,500,000 tons, plus the plants Poland had taken over from the Czechs. All told, the German industry has, at the expense of these countries, been expanded by about 4,500,000 tons, or nearly a quarter of the 1937 German capacity. On the surface, this would seem a rather comfortable addition, but actually it is far from being an unmixed blessing, since these areas produce little more than half of their ore requirements, so that the net result is not simply an increase of 25% in steel output, but an increase of about 10% in an already large ore deficit. As a result of these additions, as well as enlargement of home plants, the maximum German productive capacity is reported to be 23,000,000 tons of pig iron and 29,000,000 tons of steel.

Ore production in Germany increased 13% from Jan. to June 1939, while ore imports jumped 41%. Pig iron and steel outputs rose less than 10% from January to July, from which one is led to infer that the bulk of the increase in the year's totals, 10% for pig

THE MILLS of Republic Steel Company at Cleveland, like those of all major U.S. steel producers, began operating on night schedules about Sept. 8, 1939, to fill the rush of war orders

World Production of Pig Iron
(In millions of long tons)

	1929	1932	1937	1938	1939
North America—					
Canada	1.2	0.2	1.0	0.7	0.8
United States . .	42.6	8.8	37.1	19.3	31.5
Europe—					
Belgium	4.0	2.7	3.8	2.4	2.9
Czecho-Slovakia .	1.6	0.4	1.6	1.2	0.3
France	12.3	6.8	7.8	6.0	7.8
Germany	13.2	3.9	15.7	18.2	20.1
Luxemburg . . .	2.9	1.9	2.5	1.5	1.8
U.S.S.R. . . .	4.0	6.3	14.4	14.8	15.2
United Kingdom .	7.6	3.6	8.5	6.8	8.1
Asia—					
India	1.4	0.9	1.6	1.5	1.8
Japan	1.5	1.5	2.8	3.1	3.3
World Total . .	97.2	39.2	101.6	80.5	102.5
Ex. U.S.A. . .	54.6	30.4	64.5	61.2	71.0
Ex. British . . .	86.7	34.3	90.2	70.3	91.1
Brit. Empire . .	10.5	4.9	11.4	10.2	11.4



STEEL INGOT PRODUCTION in the United States: percentage of capacity

iron and 6% for steel, came from acquisition of new producing areas rather than from actual increase of home output. The latest survey gives the United Kingdom a maximum steel productive capacity of 14,700,000 long tons, an increase of 6.5% during 1939. Iron ore production in France in June 1939 was 16% above that of January, while pig iron output was 26% higher, and steel output 29% higher; monthly figures for the last half of the year are not available, but output evidently continued to rise, as the total for the second half exceeded that for the first half of the year by 4% for pig iron and 6% for steel. Eight new electric steel furnaces were installed during the year. The war is said to have caused shortages of ore and coke in Belgium, but nevertheless the October output of pig iron was 11% greater than in January, while steel was 24% higher, and the year's total showed an increase of 20% for pig iron and 27% for steel, over those for 1938.

China.—Changes in the map of the industry, resulting from war, have not been confined to Europe. In China, two 100-ton and two 250-ton blast-furnaces and two 30-ton open-hearth furnaces have been removed from the Hanyang Iron Works to a point in the interior. Other new construction includes 8,000 tons annually of crucible steel and 10,000 tons of soft steel. (See also FLUORSPAR; METALLURGY.) (G. A. Ro.)

Ironside, Sir (William) Edmund (1880—), British soldier, was born May 6, son of a surgeon-major of Ironside, Aberdeenshire. He entered the Royal Artillery in 1899 and went to South Africa, where he saw active service in the Boer War. At the outbreak of the World War he was a general staff officer, third grade. By 1918 he had advanced to brigadier-general in command of the 99th Infantry brigade in France, and shortly before the armistice he was transferred to Archangel as commander-in-chief of the Allied troops there. Thereafter he commanded various forces overseas, and was promoted general in 1935. He was appointed aide-de-camp general to the King in 1937, was commander-in-chief of the Eastern command (1936–38) and commander-in-chief of British forces in the Middle East. In Oct. 1938 he was appointed governor and commander-in-chief of Gibraltar. On May 31, 1939, he was named British inspector-general of overseas forces. The day after the Franco-British declaration of war against Germany he began staff conferences in Paris with Gen. Maurice Gustave Gamelin.

Irrigation. As a result of the water supply forecasting program initiated by the Federal Government in 1935, it is now possible to gauge in advance the amounts seasonally available for irrigation, so permitting some assurance in the planting and harvesting of early or late maturing crops dependent upon such supplies. These forecasts are released periodically from December to April. They refer to future water supply either as accumulated snow in the higher altitudes, or water in surface or underground reservoirs in the lower regions. The closing forecast

for the 1939 irrigation water supply indicated a below-average supply throughout the 11 Far Western States. With a few exceptions where storage was carried over from 1938, these expected conditions prevailed. The series of dry years extending back to 1926, has forced a vast expansion of storage facilities, both surface and underground. It is estimated that the cost of irrigation reclamation in the West has totalled about \$1,500,000,000, more than half of which was financed by private interests. Recently, however, the program has been almost entirely under Federal supervision with funds made available by Congress and allocated to several agencies involved in irrigation agriculture. In Federal reclamation projects alone, water storage during the past six years has increased more than five-fold. Since 1933, when 46 reclamation reservoirs held 7,000,000 ac.-ft. of water, storage capacity has risen to more than 35,000,000 acre-feet. This great increase is largely due to the completion of 24 new reservoirs including Lake Mead on the Boulder Canyon project, which now holds back nearly 25,000,000 ac.-ft. of water. (See also DROUGHT.)

In Idaho, at the Minidoka irrigation development, three reservoirs can hold 2,300,000 ac.-ft.; in the two reservoirs of the Rio Grande development in New Mexico-Texas 1,150,000 ac.-ft. may be stored, and in the State of Washington at the Yakima development, five reservoirs can hold 1,000,000 acre-feet.

Construction work was completed by the Federal Bureau of Reclamation on eight dams during 1939, including the Bartlett dam on the Verde river in Arizona, the world's highest multiple-arch dam. The construction program of the Bureau has been accelerated with appropriations from the Reclamation fund, the General funds of the Treasury, and carry-over Public Works Administration allotments under Emergency Relief Appropriation Acts.

Among the more important projects under construction in 1939 were the Grand Coulee dam on the Columbia Basin project in the State of Washington; the Shasta and Friant dams on the Central Valley project in California; and the Green Mountain dam on the Colorado-Big Thompson project in Colorado. During its fiscal year, the bureau also built more than 250 mi. of canals, 138 mi. of drains, 32 tunnels, 70 mi. of pipe lines, 11,000 canal structures and 100 flumes. The Emergency Relief program placed several other Federal Departmental agencies in construction fields leading to irrigation, notably the Corps of Army Engineers and the Department of Agriculture through its Soil Conservation Service and the Water Facilities Administration. The Regional Salinity Laboratory, an institution of the Federal Government intended to permit study of the effect on crops of various concentrations of salt in irrigation water, was completed in 1939. It is at Riverside, Calif. (See also DAMS.)

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Italy.—During 1939 irrigation projects were being carried out in various regions of Italy. In Sicily the integral reclamation of the Latifondi covering 1,250,000 ac., include the building of reservoirs, aqueducts, the sinking of artesian wells and the provision of other necessities to ensure against seasonal droughts. This is a 2,000,000,000 lire project. The amount to be spent on irrigation is estimated at about 400,000,000 lire. Similar projects are being carried out in Apulian Table, the Tuscan Maremma, on the plains of Salerno and in Albania and Ethiopia.

The Netherlands.—Work on the second polder has been proceeding. A short time ago the dike between Lemmer, on the Friesland coast, and the Island of Urk, in the Ysel-lake, was completed. This dike extends for about 15 miles. It is to be expected that the dike between Urk and the Overijl coast will be completed in 1940.

China.—In July 1938, despite the fact that war had been raging for a year, the Ministry of Economics was able to report the completion of two large irrigation projects in the Northwest. One of these is the Mei Huei canal in Shensi, which irrigates 200,000 mow and increases annual production to the value of \$1,000,000. The other is the Tao Huei canal in Kansu, which irrigates 35,000 mow and increases the agricultural yield by \$200,000 annually. There are also several other such projects in the process of construction. In Shensi, there are the Lo Huei canal, irrigating 500,000 mow, the Ho Huei canal irrigating 100,000 mow, and the Yen Huei canal irrigating 470,000 mow. In Kansu, there is the Huang Huei canal, irrigating 30,000 mow. In the south-west, plans are in progress for the irrigation of a total of 200,000 mow in Szechwan, 10,000 mow in Kweichow, 190,000 mow in Kwangsi. Along the Yunnan-Indo-China railroad near Kaiyuan and Mengtze, good irrigation works can reclaim about 200,000 mow for cultivation. The successful completion of these projects should contribute more to the solution of the grain problem than any other single technical improvement.

Russia.—New irrigation systems are being constructed in Central Asia, Kazakhstan, Siberia, the Caucasus and in the region of the Volga river. More than 30 canals are now being built which will irrigate 1,235,483 ac. of collective farm fields.

The first unit of the big irrigation project on the Chu river has been completed. This provides 74,128 ac. of land in Kazakhstan and Kirghizia with irrigation. New cotton fields have been planted in the valley of the Chu river.

The first unit of the construction of the Allay irrigation system in the Altai district has been completed. This is the first big irrigation project in Western Siberia. The water will flow from the Allay river along the canals whose length is 20 mi. and will irrigate 27,156 ac. of nearby fields, most of which are sown to sugar beets. The first large system of machine irrigation has been constructed on the Irgiz river in the Saratov district, where a huge floating pump station has been completed which will provide water to the surrounding fields.

A new canal is being completed in the fertile valley of Arkhan-Churt in the Caucasus. With the construction of the main canal in 1940 which will be supplied with water from the Terek river, 14,826 ac. will be irrigated.

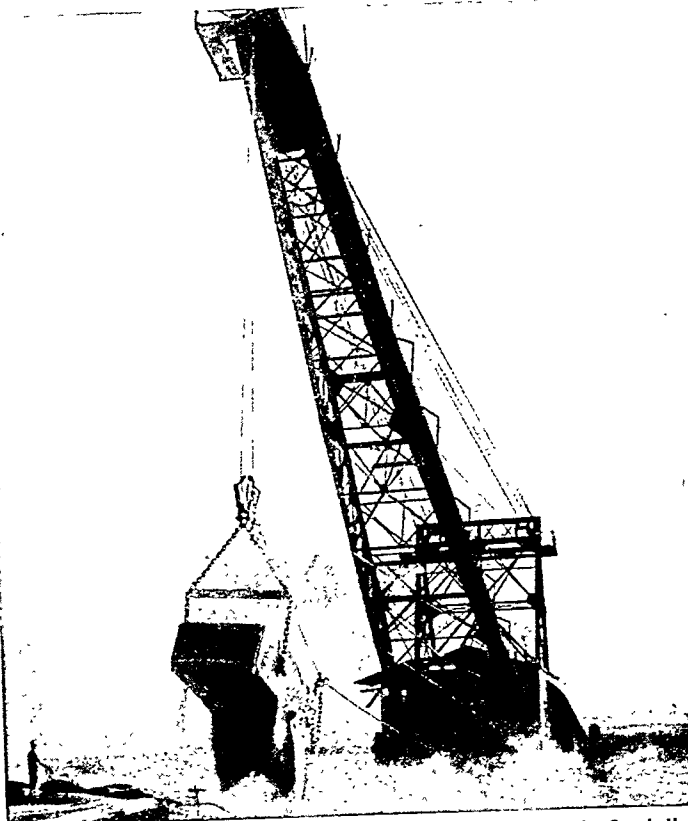
The first Ordjonikidze Milsky canal has been completed. Supplied with water from the Araks river, it will irrigate more than 74,128 ac. of land of the Milsk-Kharabakh valley. An outstanding irrigation project will soon be completed in the Armenian S.S.R. The first unit which has been built will provide water for 69,186 acres. This system is fed from Lake Sevan and the Zanga river.

Construction of the Shakhroud irrigation system in Uzbekistan and the Tash-Keprin reservoir in the Turkmen S.S.R. neared completion. The reservoir will contain approximately 134,000 ac.-ft. of water which will be used for irrigation of cotton fields.

Mexico.—The activities of the Mexican Government in regard to irrigation during 1939 have comprised: (a) Large projects destined to give irrigation service to vast sections of the country; (b) Small projects suitably distributed in the different States of the republic, to benefit small groups of peasants.

Among the large irrigation works are El Palmito dam, which is being constructed in the State of Durango, on the Nazas river, and which, when completed, will make possible better utilization of the water of that stream for irrigation and development of water power. This earth dam has a maximum height of 92 m. and will impound 3,000,000,000 cu.m. of water. El Azúcar dam, also of earth and having a maximum height of 43 m., on the San Juan river, a tributary of the Bravo river, in the State of Tamalipas, will form a reservoir having a capacity of 2,100,000,000 cubic metres. The purpose of this project is to make use of the waters of this stream in the irrigation of 60,000 hectares, and also to control its violent flood waters and prevent the disastrous inundations which sometimes occur. La Angostura dam, of concrete arch type, with a maximum height of 88 m., constitutes one of the first stages in the construction of the works required for the utilization of the waters of the Yaqui river in the State of Sonora for irrigation and power development. It is constructed on the Bavispe river and will impound 1,270,000,000 cu.m. of water.

Beside these three dams, other important works are being constructed in different sections of the country. These include the Solis dam on the Lerma river, Guanajuato; a diversion and canal in Cutzamala, Guerrero; a dam and canals in Huichapan, Hidalgo; the Ixmiquilpan canal; a dam and canals in Morelia and Queréndaro, Michoacan; a diversion and canals and canals in Tarecuato, Michoacan; a diversion and canal in Tehuantepec, Oaxaca; the S. Ildefonso dam, Querétaro; Obregón dam in S. Luis Potosí; the Tesla canal, Sonora; several canals in Yaqui Valley, Sonora; and a diversion dam and canals in Sta. Rosa, Zacatecas.



A 134-MILE ADDITION to the All-American canal in California—the Coachella branch—was begun in 1939. The giant shovels used in digging the canal lift 32 tons of sand in one loading

Activities are being continued in the following large irrigation districts with works previously constructed: D. Martin, Coahuila; Delicias, Chihuahua; S. Carlos, Coahuila; Ciudad Juárez, Chihuahua; Culiacán, Sinaloa; Lerma river, Guanajuato; Chapala, Jalisco; Colorado river, Baja California; Lagunera region, Coahuila and Durango; Colima, Colima; Los Altos, Jalisco; Magdalena and Ahualulco, Jalisco; Arroyozarco, Mexico; Tierracaliente, Michoacan; Zamora valley, Michoacan; Zacapu, Michoacan; Oaxaca valley, Oaxaca; Altar, Sonora; La Antigua, Veracruz; and districts of Yucatán.

Various small irrigation works have been studied and constructed in all of the country in order to solve local problems of small groups of farmers, placing under irrigation approximately 5,000 hectares.

The area irrigated by means of works of the National Irrigation Commission is 500,000 hectares, and on completing the different stages of the projects under construction, it will be possible to irrigate about 1,000,000 hectares. In addition, projects are being considered which will permit the irrigation of another 700,000 hectares. (A. T. M.)

Islam. Two general tendencies were in operation in the Islamic world during 1939, one towards greater unity and solidarity among the Muslim powers, the other in the direction of economic consolidation and modernization.

In pursuance of an anti-aggression Eastern pact, there was a meeting of the representatives of Turkey, Iran, Iraq, and Afghanistan in Teheran in April 1939. Protests and demonstrations were made in most Islamic countries against the virtual absorption of Albania by Italy on April 7. Italy's policy in the Tripolitaine also evoked criticism. A movement in the direction of greater friendliness or at least less hostility is noticeable in the relations of the Islamic world with the Western democracies. Egypt has had intimate treaty terms with Great Britain, but such discontent as was caused by the disapproval of British policy to the Arabs in Palestine has been relegated to the background by the new situation in the eastern Mediterranean, in which Egyptian, British and Turkish interests are identical. The visit by the French prime minister M. Daladier to French North Africa (Jan. 1939) showed that in spite of the under-current of nationalist opposition, France could rely upon the support of her Muslim subjects and allies against any disturbing factors in that region.

The late Kemal Atatürk was the originator of many of the new

ideas now infiltrating the Islamic world. Under his successor, Ismet İnönü, Turkish policy in its ultimate aims remains the same. But there is a change almost imperceptible in method and in spirit. The evils and empty forms against which Atatürk fought have been swept away, and there is more tolerance now of the slower processes of religious and social evolution. Turkey's alliance with France and Great Britain brings her out definitely from a position of neutrality to a position of responsibility in the larger issues of Europe and the world. Her acquisition of the Sanjak of Alexandretta (the Hatay) from France has however been criticized and has brought her into conflict with Arab opinion.

Economic consolidation is being pushed with vigour in all independent Islamic countries. Turkey's new Four Year plan started in 1939 with a credit of £10,000,000 from Great Britain. She is also pushing on her agricultural expansion and her mineral exploitation, at the same time that she is attending to her harbours and her mercantile marine. Iraq's wealth depends upon irrigation, and her latest Habbaniya scheme will enable her to conserve some of the Euphrates water and at the same time lessen the danger from floods. Saudi Arabia opened her first oil and commercial port in May 1939 at Ras Tanaura on the Persian Gulf, and has now an oil pipe line in the coastal region of the Hasa. Road improvements are being pushed on, and the water of the sacred spring of Zemzem is being purified and sterilized. The oversea pilgrims at the Pilgrimage of 1357 H. (Jan. 1939) numbered only 52,000, compared with the peak figure of 135,000 in 1927,—a sure index of economic depression and unrest in the Islamic world. Egyptian economic development is being pushed on through the Bank of Misr, and Egyptian ships have captured 80% of the pilgrim traffic to Jiddah. Communications are being improved everywhere, and a remarkable asphalted road, 600mi. in length, with major and minor bridges, is being pushed through the Arabian desert.

It will run from Haifa to Baghdad, through Palestine, Trans-Jordan and Iraq, with feeders connecting it with Damascus, Cairo, Jerusalem and Amman.

The first mosque in Canada was inaugurated at Edmonton (Alberta) by an Indian leader then in Canada, in a public ceremony attended by the mayor of Edmonton (J. W. Fry), and other notabilities. One of the principal benefactors was the late Ali Tarra-bin, a Syrian Arab merchant who originally came from Damascus.

The women's movement is making rapid progress. Teheran was the scene of brilliant public festivities in April 1939 in celebration of the marriage of the Crown Prince (Shahpur Mohammed Reza) to the Egyptian princess Fawzieh, who appeared at public receptions with the Queen Dowager Nazli of Egypt. Muslim women attended unveiled the international Inter-parliamentary Conference on Palestine in Cairo in Oct. 1938, and there is a Muslim lady in the Punjab ministry in India. Muslim women have special constituencies of their own in the electoral rolls in India, besides participating in mixed constituencies.

On the artistic side Iran and Turkey show the greatest progress. Turkey has special schools of sculpture and painting. The Government of Iran is encouraging national music (*Musiqi-i-kishwar*) and the renowned Arab singer Muhammad Abdul Wahhab has been heard on the radio from Egypt. (A. Y. A.)

Isle of Man: see BRITISH EMPIRE.

Isotopes, The Separation of. When the existence of isotopes or atomic varieties of an element with different masses was first suggested some 30 years ago, the experience of chemists supplied conclusive evidence that the chemical properties of such isotopes were identical. None of the usual methods for separating chemical substances,

such as distillation, fractional crystallization or fractional precipitations, were believed to be effective in this case because, had such been true, variations in atomic weights would have been observed. The only methods which appeared to be available at the time for the separation of such varieties of atoms depended upon the physical differences to be expected from the kinetic theory of gases, such as fractional evaporation and fractional diffusion. Early work demonstrated that the atomic weights of the elements can be changed by such fractionation methods, and this furnished a confirmation of the existence of isotopes.

The very marked differences in the chemical properties of protium and deuterium, the two isotopes of hydrogen, resulted in the complete separation of these isotopes by fractional electrolysis and today heavy hydrogen, which exists in natural hydrogen to the extent of only one part in 6,000, is an article of commerce. The method consists in the electrolysis of caustic alkali solutions. The hydrogen gas which escapes in the process contains about one-sixth to one-tenth as much deuterium as the water from which it is electrolyzed, and hence the deuterium increases in concentration in the residue. When this process is continued until only a small residue remains, this residue consists substantially of 100% deuterium oxide. Attempts have been made to apply this same method to the separation of the isotopes of other elements, but the very slight differences in the rates of discharge of the isotopes of other elements do not permit an effective separation by these methods.

Three methods for the separation of isotopes have been developed in recent years, all depending upon the multiplication of the effects of a simple process separation, by the application of counter-current methods. Thus if any process produces a difference in concentration of the isotopes and the light and heavy fractions can be made to move in opposite directions in the apparatus, high concentrations of the two constituents will be built up at the opposite ends. In this way the effect of small differences can be increased greatly.

The first of such methods to be developed was a cascade diffusion method in which gases were allowed to diffuse through porous tubes, the lighter isotope diffusing more rapidly than the heavier. The residue from such a diffusion process was pumped to a preceding diffusing unit of the cascade and the lighter fraction was transferred to a subsequent unit in the cascade. Each diffusing unit changes the ratio of the isotopes in the gas by approximately the square root of the ratio of the masses, e.g. by about 5% in the case of neon. If a cascade of n units is arranged in this way the overall fractionation to be expected is $(1.05)^n$; thus, if some 50 units are used in such a cascade the very appreciable fractionation by a factor of 10 can be secured. In this way nearly pure samples of the neon isotopes have been produced, and some work has been done on the carbon, nitrogen and oxygen isotopes. This method is able to produce a few cubic centimetres of Ne^{22} gas in twenty-four hours from natural neon containing 10% of Ne^{22} and 90% of Ne^{20} .

The thermal diffusion method was developed in 1939. If two sides of a vessel containing a gas are maintained at different temperatures a partial separation of the isotopes of the gas will be effected. The lighter isotopes will concentrate in the warmer side of the vessel and the heavier isotopes in the colder side. Rather small effects can be secured in this way, as has been well known for a number of years. However, if two parallel surfaces are mounted in a vertical direction, as, for example, by arranging two concentric tubes in a vertical position, and a sample of gas is placed between them, the one surface being maintained at a higher temperature than the other, a separation of the isotopes will occur. Convection currents will be set up by the difference in temperature and a stream of gas moving downward

will contain an increased concentration of the heavy isotope, while a stream moving upward will contain an increased concentration of the lighter isotope. This process will produce different concentrations at the two ends of the tube, and this will continue until the effects of back diffusion prevent further changes in concentration. Very large separations of isotopes can be secured by this simple method, and practically the complete separation of the isotopes of chlorine has been effected in this way. In fact, a sample of chlorine with an atomic weight less than 35 and another of atomic weight of nearly 37 have been secured. The method is now being applied to the separation of the isotopes of many elements which can be secured in the form of gaseous compounds. It appears that its rate of production is about the same as that of the diffusion method described above, but the apparatus required is far simpler.

A third method for the separation of certain isotopes makes use of slight differences in the chemical properties of isotopes. A slight difference in the relative abundance of isotopes may exist when two phases containing the element are brought to equilibrium. Thus water vapour contains less of the heavy oxygen isotopes than liquid water with which it is in contact, ammonia gas contains less N^{15} than does a solution of ammonium salt with which it is in equilibrium, and hydrogen cyanide gas contains more of the heavy carbon isotope C^{13} than does a sodium cyanide solution in equilibrium with it. In order to effect a separation making use of these differences it is only necessary to arrange a counter-current scrubbing system, the liquid flowing downward and the gas flowing upward. Such apparatus is commonly used in chemical processes in the form of fractionation columns. Fractionation columns are of different forms, but all consist of an apparatus designed to bring the liquid flowing downward through the column into intimate contact with the gas flowing upward. Those used for the isotope separation work so far consist of glass tubes from $\frac{3}{8}$ " to 3" in diameter, filled with glass spirals designed to expose a very large surface of the liquid flowing downward to the gas flowing upward. The operation proceeds in the case of the nitrogen by pumping an ammonium nitrate solution into the top of such a column and at the bottom adding sodium hydroxide, boiling the ammonia from the solution, allowing the ammonia gas to flow backward up through the column and absorbing it in water flowing to waste at the top. After some time of continuous operation the concentration of N^{15} increases at the bottom. By using apparatus of this type nitrogen has been produced containing 72% N^{15} , and at the rate of about one gram of nitrogen of this concentration per 24 hours.

In the case of carbon the concentration is effected by the use of sodium cyanide solutions flowing downward through the columns and hydrogen cyanide gas flowing upward. In this case the C^{13} concentrates preferentially in the gas phase so that hydrogen cyanide gas is fed to the apparatus at the bottom, and sodium hydroxide solution introduced at the top, which reacts to give sodium cyanide solution which flows down the column and is discarded at the bottom. In this way 20% to 25% C^{13} has been produced instead of the natural abundance of 1.06%. The rate of production in this case is about half a gram of carbon of this composition per 24 hours. There appears to be no reason why production of both heavy nitrogen and heavy carbon cannot be increased very considerably over the figures so far obtained by these methods.

Experiments using such exchange reactions have been made in the case of sulphur as well, and some increased concentration has been secured, using sodium hydrogen sulphite solutions and sulphur dioxide gas.

It is, of course, not necessary to use liquid and gas phases only in this type of experiment. Two immiscible liquid phases could also be used travelling in opposite directions in such apparatus.

This has been used to effect a considerable concentration of the lithium isotopes by using a solution of lithium salt in alcohol solution for one liquid phase and a solution of metallic lithium in mercury as the other. Also, a solid liquid equilibrium has been used to secure some concentration of the lithium and potassium isotopes. In this case a water solution of an alkali metal salt has been allowed to flow through a zeolite of another alkali metal. The first alkali metal replaces the second from the zeolite, but the isotopes of the second alkali metal are not displaced in proportion to their concentrations from the zeolite, and hence one isotope trails behind the other in the washing out process.

The separation of the isotopes of the elements has been the most difficult problem of separation which chemists and physicists have undertaken. It cannot be expected that the separated isotopes will have commercial importance in themselves, for since their properties are so nearly the same only rarely can it be expected that the slight differences would be sufficient to make the use of a separated isotope preferable to that of the natural element. However, from the standpoint of scientific research there are many experiments which can be attacked once sufficient amounts of the isotopes are available. Thus, wherever it is desirable to follow the course of an element through a very complicated chemical system, such isotopes can be used as tracers. One of the most complicated and most interesting of such systems is presented by living organisms, and it is to be expected that new and very important information can be secured by their application in biological fields. (See also MATTER, STRUCTURE OF; PHYSICS).

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Italian Colonial Empire. The table on p. 378 gives essential material relative to Italy and the colonial and mandated territories administered by her. Total area 1,486,914 sq.mi.; total population (est. Dec. 31, 1937) 58,099,000.

History.—The tension between Italy and France following the former's denouncement in Dec. 1938 of the Franco-Italian Agreement relating to Tunis (1935), continued in the early part of 1939, and there were persistent rumours of the massing of troops in the Italian African colonies adjacent to the French possessions. In Libya an order prohibited listening to the Tunis broadcasting station. A number of arrests for espionage were made.

The situation had eased slightly by March when Count Ciano informed the British Chargé d'Affaires that the troop movements in Libya were "purely defensive." On April 9, Field Marshal Goering visited Tripoli and was received by the governor, Marshal Balbo. The following month General von Brauchitsch paid a similar visit. An attempt to improve economic relations with Egypt was made in May when Marshal Balbo visited King Farouk and the Premier.

In introducing the budget for Ethiopia, the under-secretary for Italian Africa announced on May 10 that Italy controlled the whole country materially and morally. There were small groups of hostile natives operating in Shoa and Amhara, but the mass of natives was content under Italian rule. At present, owing to the immense number of natives employed on roads and other public works, no normal economy was, however, possible in the country.

As part of the public works already completed, a road across the Danakil desert from Assab to Dessye was officially opened on September 22. It is linked with the road to Addis Ababa and is described as the backbone of communication in the new Empire, since it provides the shortest route (540mi.) from the capital to

Italian Colonial Empire

Country and Area square miles (approx.)	Population (000's omitted)	Capital, Status, Governors, Premiers, etc.	Principal Products 1938 (in metric tons)	Imports and Exports 1938 (in lire, 000's omitted)	Road, Rail, and Shipping 1938	Revenue and Expendi- ture 1938-39 (in lire, 000's omitted)
ITALY, 119,740	44,069	Rome, kingdom, <i>King</i> : Victor Emmanuel III. <i>Premier</i> : Benito Mussolini.	wheat 8,091,800; maize 2,936,000.	imp. 10,918,000† exp. 7,960,000†	rds. 12,030 mi. rly. 10,394 mi. shpg. cleared (month- ly av.) 7,713 tons	est. rev. 25,072,000 exp. 25,035,000.
ALBANIA, 10,632	1,038	Tirana, annexed kingdom. <i>Lieut.-General</i> : F. Jacomoni di San Savino	maize 155,345; wheat 44,910.	imp. 22,979‡ exp. 9,749‡	rds. about 1,200 mi.	rev. and exp. 40,000§
AFRICA Italian provinces of Libya, 213,876	703*	Tripoli, to be included in the national territory of Italy, <i>Governor-General</i> : Marshal Italo Balbo.	(1937) barley 38,000; wheat 17,500.	imp. 882,057 exp. 108,901	rds. 3,260 mi. rly. 271 mi. shpg.: passengers arrived 92,256; departed 80,614	est. rev. and exp. 462,345.
LIBYAN SAHARA, 465,482	48	Homs, colony, under military authority.				
ITALIAN EAST AFRICA, including Ethiopia, Eritrea and Italian Somaliland, 676,149	12,100	Addis Ababa, colony, <i>Viceroy</i> : H.R.H. the Duke of Aosta.	barley (Eritrea 1936) 10,000; coffee (Ethiopia, ex- port 1937) 14,000	imp. 2,477 exp. 191	rds. 3,142 mi. rly. 709 mi. shpg. passengers arrived, 133,128 departed 156,176	(est.) Ethiopia: rev. and exp. 1,591,128. Somaliland: rev. and exp. 70,705.
ASIA Italian Islands of the Aegean sea, 1,035	141	Rhodes, colony, <i>Governor</i> : Count C. M. de Vecchi.	olive oil 617; wine 27,000 hectolitres	(1937) imp. 122,374 exp. 19,705	rds. 376 mi.	(1934-35) rev. and exp. 48,000.

*Libyan population, Italians excepted, the latter being included in Italy. †Excluding trade with colonies. ‡In gold francs. §In gold francs, est. April 1, 1939 to June 30, 1940 (=15 months).

the Red sea. Other public works include the building of new European towns and extensive port developments at Assab, Kismayo and Mogadishu. Three oceanic roads are either under construction or planned to link Addis Ababa with Mogadishu on the Indian ocean, "the free sea which lies beyond Suez and Aden."

On October 31, General Teruzzi was appointed minister for Italian Africa, a post previously held by the Duce. It was announced early in Jan. 1940 that a number of Italians formerly domiciled in France were to be sent as colonists to Italian Africa.

Italian East Africa: see ITALIAN COLONIAL EMPIRE.

Italian Literature. The beginning of the literary year was marked by the "Aryanization" of publishing houses and the "book reclamation," both ordered by the Government. As a result of this campaign, several firms changed management or name and as a first step 900 books by some 200 Italian and foreign authors were "withdrawn from circulation as harmful in view of the historical, idealistic, and moral values established by Fascism." To protect the sale of Italian books, the Government discouraged Italian translations of foreign books and forbade their display in bookshops.

Judging from the year's gross literary output, it would appear that the Italians are dwelling especially upon the great authors of the past. The works of Machiavelli (Barion, Rizzoli), Vasari (Mondadori), G. Vigo (Laterza), Gioberti (Bocca), to mention but a few, are appearing in new and attractive critical editions. Many reprints have also been made of works by 20th century writers ranging from Serao to Panzini, who died in April.

One of the most valuable results of this quest for the past is the appearance of an unusual quantity of letters and diaries—mostly inedita. Notable are the *Epistolario Completo di Santa Caterina da Siena* (Marzocco), Guicciardini's *Carteggi* (Zanichelli), *Lettere inedite di U. Foscolo a Marzia Martinengo* (Le Monnier), Tommaseo's *Cronichetta del Sessantasei* (Einaudi), Ricassoli's *Carteggi* (Zanichelli), Cavour's *Discorsi Parlamentari* (Nuova Italia), and the *Diario e lettere inedite* of E. Thovez (Garzanti).

Three outstanding contributions enriched the history of literary criticism: *Volume XVI* of the *Studi Danteschi* series (Sansoni); V. Cian's *La Satira dal Medioevo al Pontano* (Vallardi), and G. Previtera's *La Poesia giocosa e l'umorismo dalle origini al rinascimento* (Vallardi). Of considerable importance to students

of contemporary literature is Bontempelli's *Avventura Novecentista* (Vallecchi), a literary diary relating the author's struggle for a universal literature. The first volume of S. D'Amico's *Storia del Teatro Drammatico* (Rizzoli) has appeared. Franco Abbati, noted music critic, presented the first of a three-volume work, *Storia della Musica* (Garzanti). The long-awaited publication of Gaetano de Sanctis' *Storia dei Greci dalle origini al secolo V* (Nuova Italia) adds to the field of historiography the results of long years of painstaking research. A serene evaluation of the policy of Pius XI is given by L. Salvatorelli in his *Pio XI e la sua eredità spirituale* (Einaudi). Three sound works on American culture and architecture have also been published: A. La Piana's *La Cultura Americana e l'Italia* (Einaudi); P. Carbonara's *L'Architettura in America* (Laterza), and E. and G. Cecchi's *Emily Dickinson* (Marcelliana).

The field of fiction still seems divided pretty clearly into three main groups: the first, to which belong such writers of the old guard as Samminiatielli, Chiesa and Soffici, continue to weave their past into autobiographical works; the second endeavour to instil love for bucolic as against city life; a third and large group of young writers find inspiration in the "historical, idealistic, and moral values established by Fascism." Four writers who do not fall into the above classification, have enjoyed exceptional success: R. Bacchelli, with *La miseria viene in barca* (Barzanti), a continuation of the historical cycle begun with *Il Molino sul Po*; A. de Céspedes, with *Nessuno torna indietro* (Mondadori) the story of eight convent-bred girls, now in its tenth printing; P. Margellini, with *Città di Pittori* (Vallecchi), fictionalized art criticism; and T. Landolfi, with *La Pietra Lunare* (Vallecchi), a weird and fantastic novel.

Noteworthy in the field of poetry are the posthumous lyrics of A. S. Novaro *Tempietto* (Mondadori); E. Montale's second volume *Le Occasioni* (Einaudi), and *Poesie* (Parenti) of the very promising S. Penna. N. Moscardelli's *Le più belle poesie dell'anno 1939* (Marcelliana) again proves valuable.

Among the prominent works by Italian writers living outside of Italy, are: G. Garretto's *Sicile, Terre de Douleur* (Corrêa); Lussu's *Sardinian Brigade* (Knopf); L. Venturi's *Peintres Modernes* (Albin Michel); Salvemini's *Historian and Scientist* (Harvard), and Sturzo's *Church and State* (Geoffrey Bles).

(M. F. C.)

Italian Somaliland: see ITALIAN COLONIAL EMPIRE.

Italy. Excluding Libya: area 119,740 sq.mi.; pop. (est. Aug. 31, 1938) 43,818,000. Chief towns (pop. 1936): Rome (1,148,948), Milan (1,103,960), Naples (860,176), Genoa (625,355), Turin (623,454). Ruler, King Victor Emmanuel III; language, Italian; religion, Christian (Roman Catholic).

History.—Foreign Affairs.—The most important events in Italian foreign affairs during the year 1939 were: the press campaign for Mediterranean claims during Daladier's visit to Corsica and North Africa (January 2); the visit of Chamberlain and Halifax to Rome (January 11); Ciano's visit to Stoyadinovic (January 20); the fall of Barcelona (January 26) and the extension of the appeasement policy to Spain; Daladier's speech crystallizing the Mediterranean claims (March 1); King Victor Emmanuel's speech (March 23); Mussolini's answer to Daladier (March 30); the annexation of Albania (April 7); Mussolini's visit to the French border and his declarations of foreign policy (May 14 and 19); the military alliance with Germany (May 22); the recall of Ambassador Grandi from London (July 12); the European war and Italy's non-belligerency; Ciano's declarations on foreign policy (December 16); the visit of King Victor Emmanuel to the Vatican (Dec. 21), and of Pope Pius to the Quirinal (Dec. 28).

The year began with the continuation of the campaign for territorial settlements in North Africa. The struggle for Corsica, Tunisia, and Jibuti resulted in Daladier's trip to the danger zones: Corsica, Tunisia and Algiers. The Italian press ridiculed the trip, playing up the small incidents and ignoring its fundamental success, but the visit showed clearly that Italy in her struggle with France was not to meet with appeasement and could not expect victories as easy as Germany's over the Central European countries. The Fascists hoped that a favourable agreement with Chamberlain would bring British pressure to bear upon the French Government in order to effect a Mediterranean Munich.

On January 26, Barcelona fell and Mussolini had won his most difficult international struggle. The bloodiest battle yet to arise between the democracies and the totalitarian governments was resolved in his favour. As soon as the policy of appeasement was extended to Spain, Franco became the object of much diplomatic courting and both his and Mussolini's positions in the Mediterranean were strengthened. (See also SPAIN, CIVIL WAR IN.)

Italy's Balkan policy pursued its usual course, Yugoslavia, won away from France, was the object of increasingly persuasive overtures of friendship. Count Ciano visited Premier Stoyadinovic on January 20 with the result that the Entente Powers seemed forever excluded from Yugoslavia, which they had created and armed.

Italy clarified and solidified her position in the Balkans, even though it meant giving up her claims on Dalmatia, one of the leit-motifs of Fascism, and Belgrade abandoned the Slavic minorities in Italy to their own fate.

The press centred its action against France and was answered by the French press in a caustic manner. On March 1, Daladier declared again that France would not yield either a single man or an inch of ground, and that the Mussolini-Laval agreement of Jan. 1935 (denounced by Italy on Dec. 27, 1938) was still the limit of France's offers. On March 23, the King, speaking in the new Chamber of Guilds, formally affirmed the legitimacy of the Italian claims on France, and at the same time flouted any rumours of a rift between Mussolini and the royal house. A formal Italian ultimatum was expected by March 30. The Axis again had worked in favour of Germany in the Bohemian coup (March 16) and the occupation of what was left of Czecho-Slovakia seemed to have proved that the appeasement front was disposed to go to the limit. But instead, Mussolini answered Daladier in Cosenza with a speech which was vehement but vague. While thundering against the French attitude he indicated that Italy was in no hurry.

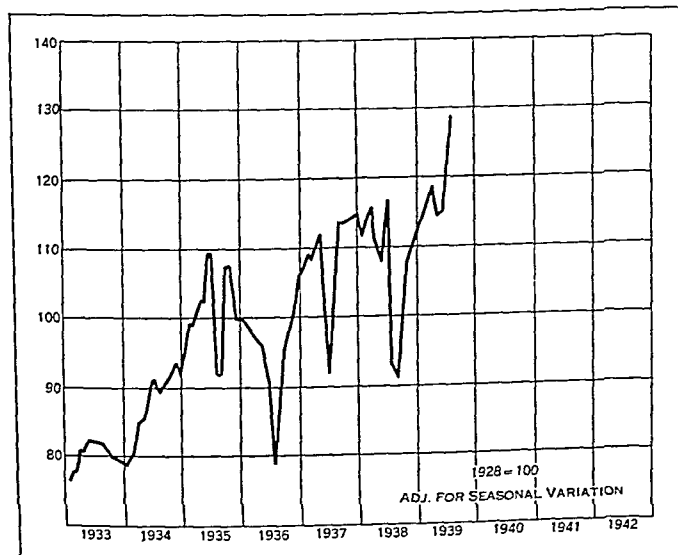
Drastic action came in the Balkans. News of disorders in Albania and of disagreements between King Zog and the Italian Government had been spread by Fascist propaganda. Rumours of impending Italian occupation of Albania were heard throughout Europe. The annexation of Albania, altering the status quo of the Mediterranean, was contrary to the Anglo-Italian agreement, but Chamberlain, still pursuing his appeasement policy, declared (April 7) that Great Britain had no objections to the annexation. That same day the Italians landed in Albania and, encountering practically no resistance, marched on Tirana. The crown of Albania was offered by a puppet Albanian Cabinet to King Victor Emmanuel who assumed the title of King of Italy and Albania. (See also ALBANIA.)

The Greek and Yugoslavian Governments viewed the Albanian coup with great anxiety. Italy, though actually in control of Albania since 1927, now took over the country directly, placing herself in a position to put direct pressure on Greece and to fight Yugoslavia on two fronts. Indeed the first public works started in Albania by the Italian Government proved to be military highways. On May 11, Prince Paul, Regent of Yugoslavia, visited Rome, thus giving his seal of approval to Italy's position in the Balkans.

The following week Mussolini visited Piedmont, *i.e.*, the French border. At the close of his visit on May 19, in giving the Cuneo address, he made two interesting pronouncements: one was that there were no problems in Europe that could not be resolved peacefully, and the other was that he would not speak in public again for a long while. It was his last bid for appeasement. On May 22, Count Ciano and Herr von Ribbentrop signed a military alliance so binding that it was called the Steel Pact, thus consecrating the success of the Axis policy in Czecho-Slovakia, Memel, and Albania.

During the month of June the problem of Danzig took on new proportions, putting the appeasement policy to a new test. The Fascists supported German claims and urged the Polish Government to yield before it was too late. It was obvious that what Mussolini wanted was another Munich with Italy getting the spoils. The Munich slogan of "peace with justice" was revamped again. Il Duce resorted to every means to soften the firmness of the French and British Governments. On July 12 Count Dino Grandi, ambassador to St. James's, was recalled and made minister of Justice. The manner of his withdrawal indicated the extent of displeasure felt by Palazzo Chigi at the British attitude.

The Italian-German alliance was solidified in the eyes of the world by the mass repatriation of the Germans living in Southern



ITALY: Industrial production index (The Annalist)

Tyrol under Italian rule (beginning July 5). Thus Italy and Germany tried to iron out their only difference and at the same time emphasize their desire for peace. Incidental to this mass migration was untold suffering, hardship, and anguish on the part of the population involved.

With the sharpening of the Danzig question the Axis policy underwent some revision. As the war clouds darkened, Mussolini saw himself involved in a struggle which did not directly concern him, and in which he might risk everything solely to secure Danzig for the Reich. As an alternative he, and after him the Italian press, pushed the idea of an international conference. Moreover the August army manoeuvres revealed that the Italian Army was in no condition to engage in a war. In an effort to avoid an untimely general conflagration Ciano went personally to see Herr von Ribbentrop and Herr Hitler (the Salzburg and Berghoff conversations, August 14). Though the communiqués declared that the Axis powers were "100% in agreement," there has been a great deal of speculation as to the real meaning of the conversations.

That the Russian-German pact took Italy by surprise has been admitted by Foreign Minister Ciano. It destroyed the anti-Comintern Front and thus changed the position of Italy. When the war finally did break out, Italy did not declare her neutrality but declared instead that the Axis still obtained, but without military activity on the Italian front. Once more Mussolini launched an appeal for peace, backed by the Catholic Church and by most of the neutral powers. But his efforts failed.

On September 19, Giuseppe Bastianini, under-secretary for Foreign Affairs, was appointed Ambassador to London. It seemed obvious that Italy wanted to make the most of her position, and, while declaring fidelity to the Axis, she was willing to flirt with the democracies. The French and British Governments did not choose to consider Fascism (*q. v.*) a part of the Totalitarianism which they were fighting, but instead chose to string along with Mussolini. No pressure of any kind was put on Italy, and Mussolini took advantage of his freedom to work feverishly for the *mise a point* of the military machine.

ITALIAN TROOPS landing at the harbour in Durazzo during the invasion of Albania, April 7-9, 1939



The Russian activity in the Baltic and the partition of Poland revealed that Russia's friendship meant as much, if not more, to Germany than did Italy's. After a month of wavering, the Italian press resumed its attacks on Bolshevism and supplied invaded Finland with air forces. But still the hopes of Mussolini, supported by the Pope, were pinned on a "peace with justice."

According to Ciano the Axis policy was thwarted by Chamberlain's overtures to the Soviets which in turn caused Hitler to sign the non-aggression pact. The Rome-Berlin Axis, in spite of Il Duce's friendship for der Fuehrer, was not to be extended to Moscow. As the year drew to a close, a last peace offensive was started again, with the Pope and most of the neutrals backing Mussolini. The renewed friendship of the Church and Fascism was sealed by the King's visit to the Vatican and the Pope's visit to the Quirinal, an epoch-making event.

Home Affairs.—At home, Mussolini continued his programs of military strength, racial purity, and self-sufficiency (*autarchia*). The racial program was carried on vigorously and the legislation which had been started in 1938, was completed during 1939. Most of the Nuremberg laws were adopted, and the concept of racial differentiation was introduced throughout the empire. The struggle for self-sufficiency which had been begun on Oct. 10, 1938, with the creation of a *Commissione Suprema*, proceeded steadily, putting the Government in control of almost every detail of the economic life. With the outbreak of the war, Government control was extended even to consumption, and in addition to the meatless days already in effect, ration cards were issued for coffee, and several products were severely limited or forbidden entirely.

The new Chamber of Guilds (*Camera dei Fasci e delle Corporazioni*) was inaugurated on March 23. Though this change had been expected for over 10 years, the actual setting-up of the new system, whereby the deputies are chosen and not elected, made no real difference. The fact that the number of deputies increased, seemed to indicate that the new set-up provided a larger number of places for party leaders. July 1 saw the establishment of the new Civil Code, the greatest codification of the changes wrought by the Fascist regime in civil life to date.

An extensive program of land redemption was launched on July 20 with the announcement that the large estates of Sicily were to be broken up into small farms on which farm-houses were to be built. The Sicilian peasants are to be the beneficiaries of this program, which entails an expenditure of 10,000,000,000 lire in 10 years. The plan calls not only for more houses, but also for the wholesale building of water and power plants. The magnitude of the plan, and the eulogistic press campaign that advertised it, demonstrated that the breaking-up of Sicilian estates is one more chapter in the traditional Fascist policy of public works with all its positive and negative consequences.

On October 31 there occurred a sweeping "changing of the guard" in which many of the leading Fascist hierarchs, including the secretary of the party, a number of ministers, and several high officials of the army, navy and air force, were removed. The most widely-spread interpretation of this house-cleaning abroad was that Mussolini had rid himself of pro-German chiefs. Following events proved this interpretation completely inconsistent. The general-secretary of the party, Ettore Muti, is a veteran of the Ethiopian and Spanish wars.

Education.—In 1937-38: public elementary schools, 131,580, pupils, 5,411,596; private elementary schools, 4,414, pupils, 132,675; students: in secondary schools, 647,505; in universities, 77,429.

Defence.—At the outbreak of the war (September), a report estimated the Army at 900,000 men; first line aeroplanes 2,200 and total strength of planes 5,500. To the Navy was added the battleship "Impero."

Banking and Finance.—National budget: revenue, 27,468,000,000 lire; expenditure, 38,642,000,000 lire; public debt (Nov. 30, 1935), 108,636,600,000 lire; notes in circulation (Mar. 20, 1939), 17,967,000,000 lire; gold reserve and credit abroad (Dec. 31, 1938), 3,826,000,000 lire. Exchange rate (average Dec. 1939) 1 lira = \$.05046 U.S.

Trade and Communication.—Overseas trade: imports, 11,061,000,000 lire; exports, 8,007,100,000 lire. Colonies and Ethiopia: imports, 209,100,000 lire; exports, 2,448,900 lire. Communications: highways, 20,803 kilometres (Dec. 31, 1938). Railways, 23,221 kilometres; electrified, 6,678. Shipping (Dec. 31, 1938) gross tons, 3,294,897. Movement to and from foreign ports (in 1,000s of tons) 23,756; to and from Italian ports, 20,061. Airways: total length, 46,669; kilometres flown, 13,594,890; passengers, 142,604; merchandise (kg.), 560,446. Motor vehicles licensed (Dec. 31, 1938): cars, 345,090; trucks, 112,566; motorcycles, 198,220.

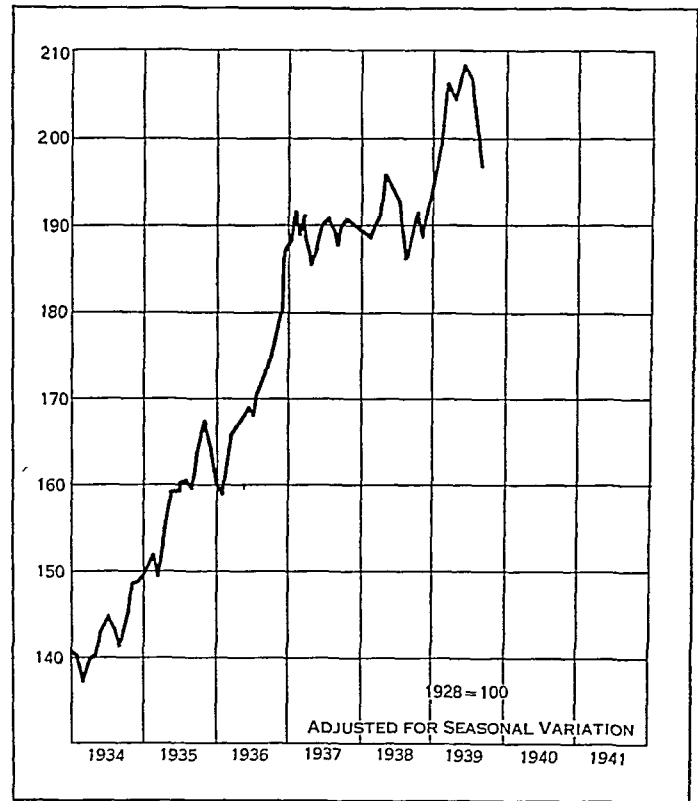
Agriculture, Manufactures, Mineral Production.—Production, to Dec. 31, 1938 (in 1,000s of quintals): wheat, 80,918; maize, 29,363; rice, 7,720; oats, 6,291; rye, 1,381. In tons: cocoons, 19,971; iron ore, 990,043; lead and zinc, 268,341; natural fuel, 2,355,117; raw silk, 1,982; pig iron, 864,536; copper, 2,963; lead, 44,031; mercury, 2,963; sulphur, 380,345. (See ANTI-SEMITISM; ARMIES OF THE WORLD; BALKAN ENTENTE; BRAZIL; EUROPEAN WAR; GERMANY; GREAT BRITAIN AND NORTHERN IRELAND; RELIGION; UNITED STATES: *Roosevelt and the Dictators*; YOUTH MOVEMENTS.) (R. So.)

Ivory Coast: see FRENCH COLONIAL EMPIRE.

Jamaica: see WEST INDIES; WEST INDIES, BRITISH.

James Tait Black Memorial Prizes: see LITERARY PRIZES: *Great Britain*.

Japan, an Empire, capital, Tokyo; ruler, Emperor Hirohito; premier, General Nobuyuki Abe (resigned Jan. 14, 1940). A chain of islands in the western Pacific, stretching from South Sakhalin (50° of latitude) to the South Seas mandated



JAPAN: Industrial production (*The Annalist*)

islands (which lie near the equator); includes Chosen peninsula, on the mainland of Asia, and the small Kwantung leased territory, with the city of Dairen, on the Liaotung peninsula. Japan Proper consists of the four main islands of Honshu, Hokkaido, Shikoku and Kyushu, while Chosen, Formosa, and South Sakhalin are administered as colonies. This is also true of the South Sea islands, which were granted to Japan under a mandate from the League of Nations after the World War (1914-18). The total area of the Japanese Empire is 263,359 sq.mi., of which Japan Proper accounts for 148,756 square miles. Population of the Empire (census, Oct. 1, 1935) was 97,697,555.

History.—(For the Chinese-Japanese War see that heading.) With the capital of the Chinese Nationalist Government established in Chungking, 1,000mi. inland, and with military operations by the Japanese troops reduced to a much smaller scale, compared with 1937 and 1938, the problem of Japan's relations with the foreign powers possessing Far Eastern interests became more important during 1939. As a result of the war Japan was in military control of all the main centres of foreign trade and industry in China, Shanghai, Tientsin, Hankow, Canton, Amoy.

It was inevitable that there should be conflicts of viewpoint between the Japanese military leaders, committed to the idea that Japan was to establish a "new order" in East Asia and foreigners, inclined to stand on their treaty rights. Great Britain possesses the largest investment stake of any nation in China, the estimated value of its holdings at the beginning of the Chinese-Japanese war being somewhat over 1,200,000,000 American dollars. The United States was also drawn into controversy with Japan because of its consistent stand for the principle of the "Open Door."

For somewhat different reasons Japan also became involved in sporadic border conflicts with the Soviet Union on several occasions during 1939.

General Issues between Japan and Western Powers.—The causes of friction between Japan and the Western Powers were greatly enhanced because of the existence in China of foreign settlements and concessions governed by representatives of foreign communi-

ties and guarded, in some cases, by foreign troops. The Japanese military authority, automatically established in every captured Chinese city, did not extend to these foreign enclaves on Chinese soil.

These foreign concessions, where the Chinese population greatly outnumbers the foreign, naturally became places of refuge for Chinese nationalists. In the large International Settlement of Shanghai and in the adjacent Chinese portion of the city there were scores of assassinations of Chinese "traitors," i.e. Chinese who consented to hold office in Japanese-sponsored regimes. Alleged laxity of the foreign police in controlling this terrorist activity was one Japanese grievance against the foreign concessions. Moreover, it was part of Japanese policy to introduce new currency issues and to establish a certain control of foreign trade in occupied territory. But the Japanese writ did not run in the foreign administered sections of Shanghai and Tientsin. Here, Japanese regulations could be disregarded in some cases, evaded in others. The attitude of the foreigners was that they were under no obligation to assist Japan in its war against China; indeed the British, French, and American Governments had given at least platonic support to China by associating themselves with statements that Japan had violated the Nine Power Treaty concluded at Washington in 1922 and prescribing respect for China's sovereignty and territorial integrity.

Moreover, the conduct of the war and the actions of the Japanese military authorities created a number of material grievances for nationals of Western powers with commercial and cultural interests in China. The Japanese Army took over the operation of the railways in occupied territory without paying any compensation to foreign holders of railway bonds. Such large river arteries as the Yangtze and the Pearl were closed to foreign shipping. On the other hand, a fairly lively trade in Japanese manufactured goods developed in the Yangtze ports. Discriminations were imposed on British shipping in North China ports. Japanese currency regulations added to the difficulties of foreign trade. The Japanese maintained a permanent military occupation of the part of the Shanghai International Settlement which lies north of Soochow Creek. There were instances of damage and looting of foreign property and a few cases of loss of life and serious injury on the part of foreigners during the military operations.

Japan and Great Britain.—Japanese feeling was especially inflamed against Great Britain, which was represented in many military and extreme nationalist leaflets and speeches as the chief enemy of Japan's aspirations on the mainland of Asia. There were a number of incidents at Shanghai, including several clashes between the International Settlement police and the police of the Japanese-sponsored Chinese administration. A British executive in a cotton mill, R. M. Tinkler, died of wounds which he received in a scuffle with Japanese soldiers in June 1939.

But the most serious Japanese-British conflict occurred in North China. Its immediate occasion was the refusal of the authorities in the British Concession of Tientsin to hand over to the Japanese four Chinese who were accused of having assassinated a Chinese customs inspector named Cheng who had taken office under the pro-Japanese administration.

Allegedly as a reprisal for British non-compliance in this matter the Japanese Army commenced to blockade the British and French Concessions in Tientsin on June 14. While the blockade was not an absolute one it slowed up and hindered the importation of food-stuffs, while British were singled out for indignities and insults when they tried to pass the barriers. They were in many cases completely stripped by Japanese sentries. At the same time an anti-British campaign was launched among Chinese in North China, with obvious Japanese encouragement. All British residents were forced to leave some towns in the interior. A Japanese



"IT'S YOUR TURN." A reference by Marcus of *The New York Times* to the Tientsin incident in 1939

military spokesman in Tientsin declared that Japan would not be satisfied with the handing over of the Chinese suspects and formulated others aims: to obtain British and French co-operation in establishing a new order in East Asia, to stop British support of the Chinese currency and to introduce pro-Japanese textbooks into the Chinese schools in the British Concession.

Grosser physical insults to Britons ceased toward the end of June; but the blockade, in somewhat milder form, was still going on at the end of the year. Conversations began in Tokyo in July between the Japanese Foreign Minister, Hachiro Arita, and the British Ambassador, Sir Robert Craigie, with a view to settling the Tientsin affair. On July 22 a joint formula was reached which the Japanese hailed as a complete surrender to their views, although the British Government repudiated this interpretation. The wording of this Arita-Craigie formula was as follows:

The British Government fully recognize the actual situation in China where hostilities on a large scale are in progress and note that, as long as that state of affairs continues to exist, the Japanese forces in China have special requirements for the purpose of safeguarding their own security and maintaining public order in the regions under their control, and that they have to suppress or remove any such acts or causes as will obstruct them or benefit their enemy.

His Majesty's Government have no intention of countenancing any act prejudicial to the attainment of the above mentioned objects by the Japanese forces, and they will take this opportunity to confirm their policy in this respect by making it plain to the British authorities and British nationals in China that they should refrain from such acts and measures.

The Chinese were finally handed over and a preliminary agreement was reached on Anglo-Japanese co-operation in suppressing terrorism in Tientsin. But the conversations failed to lead to any positive far-reaching agreement because the British Government, on August 20, declared itself unable to discuss, much less to enter into any agreement on currency and economic issues which involved the interests of other powers.

Japan and the United States.—The United States, in a note of October 6, published on October 27, complained of various alleged violations of the "open door" policy in China by Japan. The Japanese Government, in a reply dated November 18, disputed some of the American factual allegations, declared that the co-operation

of third powers in the economic development of China would be welcome and declared that Japan "was devoting its energy to the establishment of a new order, based on genuine international justice, throughout East Asia, the attainment of which is not only an indispensable condition of the very existence of Japan, but also constitutes the actual foundation of enduring peace and stability in East Asia."

The Reconstruction Finance Corporation extended to China a credit of \$25,000,000, to run for five years, in Dec. 1938. On Dec. 30, 1939, the American Government sent another note to Japan, indicating dissatisfaction with the arguments of the Japanese communication of November 18 and reiterating America's stand on the principles of international treaties regarding Far Eastern relations and the "open door."

The next important development in Japanese-American relations was the abrupt denunciation of the Japanese-American Treaty of Commerce and Navigation, signed at Washington on Feb. 21, 1911, by the U.S. Government on July 26, 1939. This denunciation very closely followed the announcement of the Craigie-Arita agreement and was interpreted in some quarters as designed to stiffen British resistance to Japanese demands. After a period of six months, after Jan. 26, 1940, the American Government will be free to impose discriminatory treatment on Japan in commercial relations.

Joseph Clark Grew, American Ambassador to Japan, told a largely Japanese audience in Tokyo on Oct. 19, 1939 that American public opinion is strongly and unanimously opposed to some of the things that the Japanese are doing in China. He declared that when Japan's "new order" is seen to be depriving Americans of their long established rights they oppose it and reminded the Japanese that they had insisted upon and received benefits from the "open door" in other parts of the world than China. Japanese press comment on the Ambassador's speech was generally to the effect that Japan had no intention of modifying its policy and that America had no right to interfere in Far Eastern affairs.

Japan and the Soviet Union.—While the Soviet Union has no concessions or extra-territorial rights in China, important causes of friction between Japan and the Western powers, there were several outbursts of sporadic fighting between Soviet and Japanese troops along the ill-defined frontier between the Japanese protectorate of Manchoukuo and the Soviet protectorate of Outer Mongolia.

The precise circumstances, scope, and results of this fighting are very obscure, because of the remote theatre of hostilities and the absence of impartial foreign observers. Amazing and probably greatly exaggerated figures of the numbers of aeroplanes shot down during these border clashes were circulated by both sides, but especially by the Japanese.

About the only reasonably certain fact about these conflicts is that they took place in the neighbourhood of Lake Buir and the Khalka river. Nomanhan, a small Mongol settlement, is frequently mentioned in statements about the fighting. The fighting seems to have gone on sporadically during May, June, and July 1939. The Japanese put forward the remarkable claim that they had shot down or otherwise destroyed 715 Soviet and Mongolian aeroplanes up to July 28. The Soviet counterclaim is that 199 Japanese aeroplanes were destroyed between May 8 and July 12, while the Soviet air force lost 52. The Soviet statement also asserted that between July 6 and July 12 Japanese-Manchoukuo casualties amounted to 5,500 killed and wounded, while 254 prisoners were taken, including 12 aviators.

No results proportionate to such losses seem to have been achieved by either side. The region of combat was a sparsely populated, semi-desert country, without large towns or important military objectives. A truce, which seemed to indicate an amelio-

ration of Soviet-Japanese relations, was concluded in September; but there were rumours of a resumption of hostilities in October.

A *modus vivendi* was found for a perennial subject of dispute, the conditions under which Japanese fishing companies may operate in Soviet waters, in March. But there was persistent bickering over the functioning of Japanese oil concessions in the northern, Russian half of the island of Sakhalin. Soviet help to China, perhaps the most serious cause of bad feeling between the Soviet Union and Japan, seems to have continued. In October there were reports from Japanese sources of an expansion of Soviet influence in the northwestern provinces of China, including Shensi and Kansu. It is not yet clear how the new Soviet expansionism in Europe will affect its policy in the Orient.

Education and Religion.—There were 47,750 schools of all kinds in Japan in 1936, with 14,949,792 students. Elementary education is compulsory, and the percentage of attendance among children of school age is 99.58. Japan has 45 universities with 71,607 students. Freedom of religion is guaranteed by the Japanese Constitution. The latest official statistics (end of 1933) reveal 41,127,307 Buddhists, 16,525,840 Shintoists, and 439,444 Christians in the country.

Army and Navy.—The Japanese Army is raised on a basis of universal liability to service of all male Japanese between the ages of 17 and 40. Its peacetime strength has been officially stated at about 230,000 organized in 17 divisions. All details of numbers and organization have been kept secret since the outbreak of the war. The strength of the Navy as of Sept. 30, 1936, was officially given as 302 warships, of a total tonnage of 1,134,823, including 9 battleships, 12 first-class and 25 second-class cruisers, 6 aircraft carriers, and 3 seaplane carriers. Under the latest fleet replacement law the naval building program from 1938 until 1943 called for the construction of 4 battleships, 2 aircraft carriers and a large number of cruisers, destroyers, submarines, and other vessels. Japan has consistently refused, since the expiration of the Washington naval treaties, to limit the size of its battleships or their gun calibre or to exchange naval building information with other powers.

Banking and Finance.—The unit of currency is the yen (worth approximately 23.65 cents in United States currency in Nov. 1939). The Japanese ordinary budget of 1939-40 (the Japanese fiscal year ends on March 31) calls for an expenditure of 3,694,666,000 yen, as against 3,514,521,000 yen in 1938-39 and 2,372,099,000 yen in 1936-37, the last pre-war year. Extra expenditure in connection with the war in China for the current fiscal year is estimated at 5,270,000,000 yen—a sum which will be almost entirely raised by new bond flotations. The Japanese national debt, which was 9,850,000,000 yen at the end of 1936, reached 15,524,209,000 yen in Oct. 1938 and had passed the 20,000,000,000 yen mark by the end of 1939. Much the greatest part of this debt is internal, Japan's foreign debts amounting to about 1,300,000,000 yen, as of the period before currency devaluations took place in almost all countries. The actual value of the foreign debt, in terms of present-day Japanese currency is somewhat greater, because almost the whole of Japan's foreign debt is in pounds and dollars and the yen has depreciated more than the pound or the dollar.

The Bank of Japan is the central bank of issue. The Yokohama Specie Bank is in charge of foreign exchange transactions and finances foreign trade. Commercial banking is largely in the hands of seven large banks: the Mitsui, Mitsubishi, Dai-ichi, Sumitomo, Yasuda, Daihyaku, and Sanwa. Foreign banks operating in Japan include the National City Bank of New York, the Hongkong and Shanghai Banking Corporation, the Chartered Bank of India, Australia, and China, the Banque Franco-Japonaise, and the Nederlandsch-Indische Handelsbank.

Trade and Communication.—Exports for the Japanese Empire in 1938 were 2,896,707,000 yen (a decline of 422,113,000 yen from 1937) and imports were 2,836,209,000 yen (a falling off of 1,118,517,000 yen, by comparison with 1937). Nominally this indicated a favourable trade balance of slightly over 60,000,000 yen. However, it is important to note that Japan's exports to so-called yen bloc countries in 1938 amounted to 1,182,261,000 yen, as against imports of 565,359,000 yen. These yen bloc countries include Manchoukuo and the occupied parts of China. Inasmuch as their currencies possess no value in international exchange Japan's effective trade balance was unfavourable to the extent of between 550,000,000 and 560,000,000 yen. The same tendency is visible in the incomplete figures for 1939. During the first seven months of 1939 Japan's exports were 1,960,079,000 yen (the figure for the corresponding period of 1938 was 1,517,329,000 yen). Its imports were 1,853,933,000 yen (1,705,999,000 yen in 1938). Japan's exports to non-yen-bloc countries during these seven months were 877,737,055 yen, while its imports from these countries were 1,308,933,743 yen, leaving an unfavourable balance of trade of 431,196,688 yen.

There were 15,254mi. of Government and private railways in 1937, in Japan Proper, besides 3,129mi. in Chosen, 935mi. in Formosa, and 300mi. in South Sakhalin. The total number of registered steamships in the Japanese Empire on Sept. 30, 1937, was 4,518, with a tonnage of 4,617,183. The number of sailing ships was 17,494, the tonnage 1,010,893. Japan had 235 commercial aeroplanes on Oct. 1, 1935. Air routes link up the main cities of Japan Proper and regular air service is maintained between Japan Proper, Formosa, the South Seas islands, Chosen and Manchoukuo. Air lines connecting Japan with such Chinese cities as Peking, Tientsin, Shanghai, Nanking, and Tsingtao were instituted in 1937 and 1938. During the year 1935-36 Japan's aeronautical companies carried 11,877 passengers, 75,643kg. of goods and 265,564kg. of mail. There were 10,570 telegraph stations in Japan Proper in 1937, and 11,920 post offices. There were 420,740km. of telegraph lines, handling about 67,500,000 messages annually. In Sept. 1937 there were 5,467 telephone exchange offices in Japan Proper, with 956,330 subscribers.

Agriculture, Manufactures, Mineral Production.—There were 5,597,465 farm households in Japan at the end of 1936. This figure shows little tendency to change from year to year. Much the most important crop in Japan was rice, with the breeding of silk worms as a secondary source of income for farmers in some parts of the country. Other agricultural products were wheat, rye, barley, oats, potatoes, and sweet potatoes. Animal husbandry plays a minor role and has mainly developed in Hokkaido, northernmost of the large Japanese islands. The rice crop for 1938 was estimated at 64,758,070 koku, a koku being equivalent to 4.96 bushels. This was slightly lower than the crop for 1937 but slightly higher than the average rice crop for the preceding five years. Some decrease was expected in 1939 because of inadequate rainfall.

Industry gives direct employment to about 6,000,000 people in Japan. Of these about half are occupied in tiny workshops employing less than five persons. These hand, or cottage, industries, where wages are extremely low, are an important factor in Japan's economy. The most important single industry is the output of textiles. Up to the outbreak of the war, which has caused a recession in the output of most of the peacetime industries, while promoting a boom in munitions and other war industries, Japan led the world in the production of rayon. Japan in 1937 was the leading exporter of cotton textiles, exports of cotton cloth amounting to 2,661,751,000 square yards. This was 1.7% less in volume, but 19.7% more in value than the figures for 1936. Japan's most striking gains in recent years have been in such heavy industries

as metallurgy, machine-building, and chemicals; and the war has accentuated this tendency. Japan ranks fourth in the world as a producer of chemicals. Other important industries are the generation of electrical power, foodstuffs, wood products, paper and ceramics. Mining output has been increasing under the stress of industrial demand. Publication of many industrial and mining statistics ceased in 1937 as a matter of war secrecy. (See also **ARMIES OF THE WORLD; COMMUNISM; CHINESE-JAPANESE WAR; FASCISM; UNITED STATES.**)

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Japanese Beetle: see **ENTOMOLOGY; HORTICULTURE.**

Japanese-Chinese War: see **CHINESE-JAPANESE WAR.**

Jarvis Island: see **SOUTH SEA AND EQUATORIAL ISLANDS.**

Jaspar, Henri (1870-1939), Belgian statesman, was born in Schaerbeek, a suburb of Brussels, on July 28. For his biography, consult *Encyclopædia Britannica*, vol. 12, p. 970. He was minister of interior and later minister of foreign affairs from 1920 to 1924, during which time he was instrumental in effecting Belgium's entry into the League of Nations. From 1926 to 1931 he was prime minister. He died February 15 in Brussels following an operation, only four days after King Leopold had asked him to form his second cabinet to succeed that of Paul-Henri Spaak, who had resigned February 9.

Java, fourth in size but most important in population and resources among the islands of the Dutch East Indies, is separated from Sumatra to the west by Sunda strait and from Bali to the east by Bali strait. With the adjacent small island of Madura, Java in 1930 had a population of 41,719,524, mostly people of Malay race professing the Mohammedan religion. The area of Java and Madura is 50,752 square miles. Java is the most densely populated land in the world, with 821 inhabitants to the square mile. Because of this density of population the economic crisis of 1929-33, during which period the quantity of Dutch East Indian exports declined by 17%, the value by 67%, brought a good deal of unemployment and distress. The number of labourers employed on large estates decreased from 1,200,000 to 600,000. The Government endeavoured to cope with this situation by organizing migration to the less thickly peopled neighbouring island of Sumatra and by encouraging the development of native industries. Another noteworthy result of the crisis was the marked increase in the purchase of cheaper Japanese goods. Japan's share in the import trade of the Dutch East Indies increased from 10% in 1928 to 30.9% in 1933. Further growth has been checked by the introduction of a quota system for Japanese goods. Approximately 40% of the land in Java is under cultivation. Java's principal exports in 1937, reckoned in tons were as follows: sugar, 1,137,666; shelled coffee, 98,849; tea, 66,716; tobacco, 47,832; cinchona bark, 6,345; copra, 498,241; pepper, 31,042; rubber, 483,124; tin and tin ore, 50,917. (W. H. CH.)

Javelin Throw: see **TRACK AND FIELD SPORTS.**

Jewish Race, Distribution of. It is practically impossible to ascertain the exact number of Jews in the world. In some of the countries where large numbers of Jews live, the census does not contain any questions as regards religion, in other countries especially in Asia no exact census is taken at all. It is also difficult to draw the exact delimitation of those included in the Jewish race. Most

census figures, as far as they consider the Jewish element at all, consider only members of the Jewish faith; and even this religious criterion is difficult of exact definition. The most reliable estimates give the number of Jews at present at about 16,500,000. Even the distribution according to countries has undergone great changes during late years. The National Socialist legislation in Germany, the conquest of Czecho-Slovakia and Poland by Germany, the anti-Semitic legislation introduced in Italy, Rumania, Hungary and Slovakia under the inspiration of National Socialism, has led partly to a decrease in the number of Jews, partly to a great shift in their distribution all over the world as the result of migratory movements. Poland before the war was the country in Europe with the largest number of Jewish inhabitants, estimated at about 3,325,000. Probably more than 250,000 perished as the direct result of the war, another 250,000 as the result of mass-persecution and starvation. Of the remainder about half came under the domination of Germany, the other half under the domination of the Soviet Union which now counts probably over 4,000,000 Jews and has the largest Jewish population in Europe, surpassed only by the United States where the number of Jews can be estimated at more than 4,500,000. Many Central European Jews have emigrated during later years to Great Britain, France, the United States, Latin American countries, Palestine and the Far East. This movement of migration has not yet come to its end by far.

Estimates for the numbers of the Jewish race vary greatly throughout the ages. In the 1st century A.D. they were estimated at 4,500,000 or about 8% of the estimated population of the Roman Empire. At about 1700 the number of Jews in the Old World was estimated at about 2,000,000. A rapid increase in the number of Jews began only with the end of the 18th century, a movement completely corresponding to a similar increase in the population of Europe and of the whole world. If we estimate the Jews at present at somewhat more than 16,000,000 and the population of the world at about 2,000,000,000, the Jews form about 0.8% of the total population. The increase in the Jewish population in the 20th century is practically everywhere slower than the increase in the surrounding non-Jewish population. Especially in Western Europe and in America the Jews show a sharply falling birth-rate. At present it may be estimated that of the 16,500,000 Jews about 9,750,000 live in Europe, 5,250,000 in the two Americas, 900,000 in Asia of whom half live in Palestine, 600,000 in Africa and about 35,000 in Australia.

In Europe there were ten countries with a population of more than 100,000 Jews (Poland, Soviet Union, Rumania, Germany, Hungary, Great Britain, Czecho-Slovakia, France, Lithuania and Netherlands), in America three (United States, Argentina and Canada), in Asia one (Palestine), in Africa three (Morocco, Algeria and South Africa). (See also ANTI-SEMITISM.) (H. Ko.)

Jewish Religious Life. The year 1939 was for Judaism the cruelest and blackest in 18 centuries. In Germany, Danzig, Memel, Slovakia and the Protectorate of Bohemia-Moravia, Nazi-organized technique for the rooting out of Jews and Judaism has gone ruthlessly forward through the burning of synagogues, confiscation of religious property, desecration of cemeteries, closing religious schools and the dissolution of communities following pillage, banishment or wanton murder of their members. In Hungary and Rumania and other neighbouring lands also synagogues were defiled and bombed.

Three million Jews in Poland have been given up to obliteration. Those in Western Poland absorbed by Germany have seen rabbis shot, synagogues destroyed, world famous Talmudic academies annihilated, religious scholars conscripted for forced labour and every element of organized Jewish religious life smashed. The

Jews in Eastern Poland have witnessed the communist ban on religious education, the prohibition of Hebrew instruction, rabbis deported, synagogues made into communist clubs and anti-God propaganda organized for the utter suppression of the Jewish religion.

The horrible fate facing Jews and Judaism in these lands filled the Jewry of adjacent countries with such grim fears that in free Yugoslavia so many sought flight in baptism that the Church had to set up unusually severe conditions for the would-be convert, and in Hungary the Union of Jewish Communities felt compelled to issue a proclamation calling on Jews not to desert their God and their people.

Great Britain's *White Paper* on Palestine, which threatened to nullify the Balfour Declaration and the Mandate for Palestine, caused such widespread consternation that Jews gathered in their synagogues to repeat the ancient pledge of the Psalms, "If I forget thee, O Jerusalem, may my right hand forget its cunning."

In democratic lands there has been a marked reaction of goodwill towards Jews and Judaism. In the United States Father Coughlin's quotations of Nazi libels were repudiated by representative Catholic leaders, while Protestant denominations and lay and religious leaders denounced every form of anti-Semitism. The Temple of Religion at the New York World's Fair was a steady witness to American democracy's interdenominational goodwill in contrast to the totalitarian States' war on religion. Outstanding also was the gift through John W. Burke of \$1,000,000 from the Friedsam Foundation to be used for Jewish religious education in New York city.

Jewish religious life has been made the poorer by the death of Adolph Buchler, principal of Jews' college, London; Israel Davidson, authority on Hebrew religious poetry; Moses Gaster, former chief rabbi of the Sephardim of Great Britain; Isaac Husik, of the University of Pennsylvania, religious philosopher; Jacob Meir, chief rabbi of the Sephardim of Palestine; Jacob Nemierower, chief rabbi of Rumania; Robert Lachmann, of the Hebrew university in Palestine, expert on synagogue music; and Israel Levi, former chief rabbi of France. (See also ANTI-SEMITISM.)

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Jewish Welfare Board. The Jewish Welfare Board is a national organization which was founded on April 9, 1917, two days after the United States entered the World War, to serve the religious and welfare needs of men of the Jewish faith in the military forces of the United States. This work has been continued in peace time and has been expanded to provide service to disabled veterans, members of the Citizens Military Training Camps and of the Civilian Conservation Corps.

The Jewish Welfare Board is also the national organization of Young Men's Hebrew Associations, Young Women's Hebrew Associations and Jewish Community Centers, of which there are 324 in the United States and Canada, with a membership of 380,000 men, women, young people, boys and girls. These organizations own 242 buildings which are used as Community Centers. The local centres conduct a varied program of recreational, cultural and social activities. The Jewish Welfare Board furnishes to its member organizations consultation service on program, membership, financial and administrative problems; undertakes community surveys and institutional studies; conducts field service in connection with local Jewish centres; publishes program bulletins; issues *The Jewish Center* quarterly; conducts extension education activities; maintains a lecture and concert bureau; co-operates in local health and physical education programs; aids in the establishment and supervision of outdoor summer camps and home camps; conducts training courses for volunteers; aids in training

and placing professional workers; furnishes technical assistance in planning and equipment of buildings; and conducts campaigns for membership enrolment, building and maintenance funds.

The board has a department of vocational guidance and has made provision for the social and cultural adjustment of refugees through local centres. The board fosters regional federations of centres which promote inter-centre relations and activities and co-operate actively with the national organization. Regional organizations operate in New England, New York State, New York Metropolitan area, New Jersey, Pennsylvania and Middle Atlantic States, in the Mid-West, and on the Pacific coast. The board co-operates with the National Association of Jewish Center Workers, composed of professional workers in the Jewish centre field, whose annual meeting was held in Buffalo, N.Y., June 12-18, 1939.

The annual meeting of the Jewish Welfare Board was held in New York city Saturday evening, April 22, and Sunday, April 23, 1939. Judge Irving Lehman is president of the Jewish Welfare Board, and Louis Kraft is executive director. The offices of the Jewish Welfare Board are located at 220 Fifth avenue, New York city. (F. L. W.)

Jitterbug: see DANCE.

Johns Hopkins University, Baltimore, Md.; president, Isaiah Bowman, Ph.D., LL.D. Enrolment for 1939 in the several schools of the university was as follows: school of higher studies of the faculty of philosophy, 309; school of higher studies in education, 49; engineering, 364 (including 40 graduate students); arts and sciences, 476; business economics, 108; medicine, 297; hygiene and public health, 176. Enrolment in the afternoon and evening courses was 3,063, and in the summer school, 946. At the end of the fiscal year the endowment of the university was valued at \$30,387,195.78 and income from all sources for the year was \$2,691,014.09. During the year the following were elected to the board of trustees: Robert W. Williams, Baltimore lawyer and son of the first professor of geology at the university; John Lee Pratt, retired engineer and industrialist, of Chatham, Fredericksburg, Virginia; and Francis White, son and grandson of university trustees, and former assistant secretary of State. Carl R. Gray, vice chairman of the board of the Union Pacific and a trustee of the university since Feb. 7, 1938, died in May, 1939.

Johnson, Royal Cleaves (1882-1939), U.S. legislator and attorney, was born at Cherokee, Ia. on October 3. Admitted to the bar of South Dakota after receiving his LL.B. degree from the University of South Dakota in 1906, he practised at Highmore in that State, was State's attorney from 1909 to 1910 and attorney-general from 1911 to 1915. He was first elected to the U.S. House of Representatives in 1915 and retained his seat for 18 consecutive years until he retired in 1933 to return to the practice of law in Washington, D.C. Although he voted against the United States' entry into the World War, Johnson enlisted as a private in the Regular Army in Jan. 1918. He advanced to first lieutenant with the American Expeditionary Forces, was wounded at Montfaucon in Sept. 1918 and received the U.S. Distinguished Service Cross and Purple Heart and the Croix de Guerre. Johnson died at Washington, D.C. on August 2.

Judaism: see JEWISH RELIGIOUS LIFE.

Jugoslavia: see YUGOSLAVIA.

Julius Rosenwald Fund: see ROSENWALD FUND, THE JULIUS.

Jumping: see TRACK AND FIELD SPORTS.

Junior Colleges: see UNIVERSITIES AND COLLEGES.

Jupiter: see ASTRONOMY.

Jute. Overproduction, which had been severely troubling the jute industry, disappeared with the advent of war in Sept. 1939, and the increase in war-time demands, including 200,000,000 jute bags ordered by the British Government for delivery by Jan. 1940, to be used as sand bags. Government control of jute was instituted following the declaration of war, a maximum price was established and restrictions placed on output, except Government contracts and excepting 50% of other written contracts. The price restriction was soon withdrawn and a licensing system established under which the Government maintained control. No licence, however, was required for the purchase and sale of jute outside the United Kingdom or for the importation of jute. Production in 1939 was estimated as between 11,000,000 and 11,500,000 bales. The pucca, or export bale, in India weighs 400 pounds. The United States reported a rise in jute bags for sacking potatoes and of jute cloth for linoleum and other purposes immediately after the outbreak of war. (S. O. R.)

Juvenile Delinquency. In the field of juvenile delinquency two topics which continue dominant are the development of children's courts and probation, and the analysis of statistics. Approximately 3,000 Juvenile Courts were in session in the United States in 1939. The present trend is toward social treatment, and away from the penal rules of the common law. Combined juvenile courts and domestic relations courts have been tried in some jurisdictions, including New Jersey, Virginia, and New York city. The National Probation Association has summarized all important provisions of Juvenile Court laws of all States under topical headings. Interpretations, comparisons, and Supreme Court decisions are given.

The Federal Children's Bureau has analyzed the juvenile delinquency cases of 28 courts which have been reporting since 1929. These courts, located in 17 States, scattered widely, represent approximately 15% of the total population of the United States. The number of cases in 1938 was 29,971 as compared with 31,038 in 1937. During the past ten years there has been a general downward trend. In eight courts, including Philadelphia, one of the largest, the decrease was between 10% and 20%. In Hudson county, N.J., the decrease was 40%. Special service bureaus of boards of education and crime prevention bureaus within police departments have contributed to such substantial decreases.

Boys represent 84% of the total number officially handled by the courts. White children were involved in 73%; Negro children in 26%, and children of other races in 1%. This racial distribution for 1939 is similar to other years. Sex offences, running away, or being ungovernable, concern 60% of the girls. Among boys, approximately half were stealing, one-third were for acts of carelessness or mischief.

In proportion, more girls are committed to correctional institutions than boys. But for both sexes there is increasing use of methods of social adjustment, rather than institutional commitment. Gradual socialization of Juvenile Courts is noted in many communities, particularly in the reorganization of the courts of New Hampshire and Rhode Island.

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Kalich, Bertha (1874?-1939), Polish-American actress, was born in Lemberg, Galicia, where she made her first stage appearance. In 1894 she was offered the opportunity to appear in the Imperial theatre at Bucharest, provided she would learn the Rumanian language. This she did in three

months. Her part in *La Dame Blanche* in Bucharest was acclaimed by critics and public despite the wave of anti-Semitism then spreading throughout Rumania. American producers were promptly attracted by the press notices, and in the same year she went to the United States, where she appeared in Yiddish presentations in New York city. Among her vehicles in English were *Fedora* (1905), *Monna Vanna* (1905), *The Kreutzer Sonata* (1907), and *Magda* (1926). She returned to the Yiddish theatre in 1927 and retired in 1931. In private life she was Mrs. Leopold Spachner. She died in New York city on April 18.

Kameroons: see BRITISH WEST AFRICA.

Kansas, a central State of the United States admitted Jan. 29, 1861, popularly known as the "Sunflower State;" area, 81,774 sq.mi.; population according to the U.S. census of 1930, 1,880,999. (State census of 1939, 1,810,359, an increase over 1938 of 4,905 and the first increase in recent depression years.) Capital, Topeka, 64,120. (State census of 1939, 75,584.)

Topeka was the third city in size, the largest being Kansas City, 121,857 (State census of 1939, 127,423), and Wichita, 111,110 (State census of 1939, 111,718, substantial increases). Of the State's population (1930) 729,834 were urban, or 38.8%; 66,344 were coloured; 1,723,131 were native-born white and 69,716 were foreign born.

History.—In the biennial election of 1938, Payne H. Ratner, a Republican, was elected governor, together with a Republican legislature. Other State officers elected were Carl E. Friend, lieutenant-governor; Frank J. Ryan, secretary of State; George Robb, auditor; Walter E. Wilson, treasurer; Jay S. Parker, attorney-general; George L. McClelleny, superintendent of public instruction; Charles F. Hobbs, commissioner of insurance. At its regular session of 1939 the legislature enacted laws for the amendment and development of statutes relating to drainage districts, the conservation of oil and gas, grain warehouses, standards for dairy products, workmen's compensation and social welfare. More far-reaching in character was the adoption of a new corporation code and a probate code. This process of modernizing the State Government was to be carried further, the research department of the legislative council being instructed to study administrative and tax-collecting agencies, and the council was instructed to study the tax code for the purpose of revising and codifying the tax laws that have accumulated since 1861. One Republican campaign pledge, the exemption of food from the sales tax, proved impracticable; another, the abandonment of sales tax tokens, was carried out. A nine-member commission was authorized to stimulate the industrial development of the State, but the governor emphasized that the objective should not be a "trade at home" campaign but rather a promotion of all its assets, including its recreational attractions, as well as its products, industrial and agricultural.

Education.—The State has over 200 public libraries, of which over half are tax supported. There are 15 public and six private junior colleges, 15 private four-year colleges, one municipal, and five State-supported institutions of collegiate grade. Other State educational institutions include a vocational school and institutions for the blind and deaf. For the school year 1936-37, the last for which data are available, there were 6,636 one-teacher district schools in operation with an enrolment in the eight elementary grades of 83,100. There were 985 two or more teacher districts (excluding cities of first and second class) with enrolments in the elementary grades of 83,769. The 88 cities of first and second classes had elementary enrolments of 119,980. All classes of elementary schools showed declines in the number of children, a continuation of the depression trend.

Agriculture, Manufactures, Mineral Production.—According to the U.S. census of 1930, the four leading money crops of 1929 were wheat (50% of total crop value), corn (24.1%), hay (8%) and oats (3.2%). Winter wheat production for 1939 (U.S. Dept. of Agriculture estimates) was 111,657,000bu. as against 152,184,000 in 1938 and a 10-yr. average (1928-37) of 138,072,000. Corn production was 37,220,000bu. as against 45,200,000 in 1938 and a 10-yr. average of 80,736,000. Production of other crops was similarly low, except barley and commercial apples. Livestock inventories were relatively small. Winter wheat planting of 1939 was 12,913,000ac. as against 13,885,000 for 1938, which was reported by the U.S. Dept. of Agriculture as of December 1 at 35% of normal condition as against 61% at the same time in 1938. The leading manufactures, according to the U.S. census of 1935, were meat packing, flour, petroleum refining, railroad cars and equipment built in shops, butter, foundry and machine-shop products, bakery products, cement, feeds and printing with 1,508 establishments producing goods valued at \$468,690,290. The annual average of bituminous coal mined for 1926-30 was 3,215,000 tons. This represents a decline from 5,204,380 for 1919. The low point was reached in 1932 with 1,953,000 tons, with the 1937 figure standing at 2,892,560 tons and the preliminary figure for 1938 at 2,560,000 tons. The major portion of the State's mineral output was made up of petroleum and natural gas. (J. C. MN.)

Kazakh S. S. R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Keitel, Wilhelm (1882—), German soldier, born September 22, was a commander of artillery during the World War. On April 1, 1934, he was promoted to major-general and the following year, when Germany introduced conscription, he took charge of the personal section (*Wehrmachtsamt*) in the war ministry, and was thus connected to a certain extent with the re-occupation of the Rhineland in 1936, and with the dispatch of German reinforcements to Nationalist Spain. In Feb. 1938, during Hitler's "army purge" of Gen. von Blomberg and other conservative members of the high command, Gen. Keitel, who was believed to be more complaisant to the Nazi Party's plans for an aggressive foreign policy, was appointed chief of the supreme command of the German armed forces. At the same time he was made a cabinet minister. In his new capacity he commanded the troops which invaded Austria in March 1938, conducted the military preparations which coincided with the Sudeten crisis six months later and directed the occupation of Czechoslovakia and Memel in March 1939. A firm believer in the merits of *blitzkrieg*, he threw the weight of the German Army and air force against Poland in September while conducting a more or less passive resistance against the Allies in the west and harassing their shipping.

Kelly, Walter C. (1873-1939), U.S. actor internationally known as "the Virginia Judge," a character he created in vaudeville, was born on October 29 in Mineville, New York. In his youth he was a machinist. He alternated his appearances as "the judge" with bit parts in legitimate-stage productions. His first major role was in the Theatre Guild's production of Maxwell Anderson's *Both Your Houses* in 1933. He retired in 1936 and died in Philadelphia on January 6.

Kennelly, Arthur Edwin (1861-1939), American electrical engineer, was born in Bombay, India, on December 17. He was educated in private schools of France and England and at University College school, London. Beginning as a telegraph operator in 1876 in England, he later became chief electrician of a cable-repairing vessel and senior ship's

electrician of the Eastern Telegraph Cable Company. From 1887 to 1894 he was the chief assistant to Thomas A. Edison and in the latter year he became associated with a firm of electrical engineers in Philadelphia. In 1902 he joined the faculty of Harvard university as professor of electrical engineering and continued teaching until 1930. He held the same academic post at Massachusetts Institute of Technology from 1913 to 1924. He was co-discoverer with the English physicist Oliver Heaviside of the Kennelly-Heaviside layer, a conducting layer of ionized gas in the upper atmosphere which has a peculiar effect upon electromagnetic waves. He invented a hot-wire ammeter and other devices which brought him a score or more of academic and scientific recognitions, including the Edison gold medal in 1933. He died in Boston on June 18.

Kentucky, an east south central State of the United States, admitted June 1, 1792, popularly known as the "Blue Grass State," area 40,598 sq.mi.; population (U.S. census, 1930) 2,614,589; estimated (July 1, 1937) 2,920,000. Capital, Frankfort, 11,620; the largest city, Louisville, had 307,745 inhabitants (1930). Of the State's population, 799,026 were urban, or 30.6%, 2,366,524 were white, 236,040 coloured, and only 21,840 foreign born. Death rate low: 9.9 per 1,000 in 1938.

History.—On Oct. 9, 1939 Governor A. B. Chandler resigned his office to fill the unexpired term of Senator W. M. Logan, deceased. Lieut. Gov. Keen Johnson, who succeeded him was nominated in the August primary, and elected in November by 460,834 to 354,704 votes over his opponent, King Swope (Rep.). Other State officers, also Democratic, were R. K. Myers, lieutenant governor; H. Meredith, attorney general; J. W. Brooker, education; W. H. May, agriculture. Only one Republican was elected to any State board. The General Assembly also is strongly Democratic: 28 of 38 votes in the Senate and 72 of 100 votes in the House. There was no meeting of the Assembly in 1939, but the Legislative Council prepared a number of measures pertaining to increased payments for the aged poor, unemployed, the Teachers' Retirement fund, and budgetary problems in general.

Efforts of the United Mine Workers to secure a new contract in the Appalachian field in April assumed national importance. The Operators' Association of Harlan county resisted extreme demands by John L. Lewis, who denounced Governor Chandler as an enemy of Labour. In reply, the Governor sent troops, May 10, to maintain order, increasing the force as union agitators became active. The U.S. courts indicted 52 coal companies for conspiracy. In August peace was imperilled by a clash in Bell county, but only one death could be directly attributed to some five months of military occupation. The operators finally signed varying contracts, and on October 3 the courts dismissed the cases against the companies. An unusual combination of firmness and tact characterized this protracted struggle.

Education.—The per capita distribution of the Common School fund, designed to assist the poorer districts, was the largest ever made—\$12.19. The school census figures, however, were in need of correction by the Federal Census of 1940, in the opinion of the new State superintendent. In Nov. 1939, Frank L. McVey, President of the University of Kentucky, reached the retirement age without definite indication of his successor.

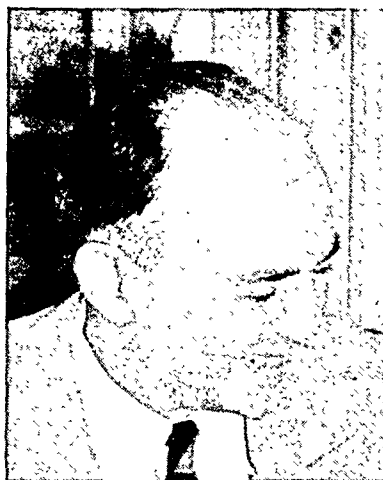
Charities and Correction.—The governor appointed Miss Margaret Woll as Commissioner of Public Welfare, replacing Frederick Wallis, resigned. At Lyndon the State purchased the Children's Home Society's property and now supervises the care and placing out of orphans. When the new prison at La Grange was finished, convicts were transferred from the old prison at Frankfort.

Finance.—In the fiscal year 1938-39 the receipts in the general

fund were \$41,395,406. Outstanding bonds on nine toll bridges and eight interstate bridges now stand at \$8,936,000. The floating debt of Kentucky has increased slightly. Reduction of revenue from the liquor trade, invalidation of the chain store tax, and increased payments for social welfare combined to increase the floating debt to \$6,953,703 as against \$5,500,000 in 1938. The main increase in expense under the Chandler administration, as compared with his predecessors, was for public buildings and public relief. Partial unemployment insurance started in Jan. 1940. There has been a steady but striking decline in receipts from the alcoholic beverage tax. This tax yielded (in millions) 9.2 in the fiscal year 1936-37; 7.1 in 1937-38, and only 5.6 in 1939. The corporation income tax totalled \$1,500,000; personal income tax, \$1,959,000; inheritance tax, \$1,866,000. Forty-nine

counties were "dry" and 27 counties were in default on their local bonds on June 30.

Agriculture and Manufactures.—Tobacco, the chief crop, was estimated in 1939 at 313,646,000lb. of all types, compared with 342,238,000lb. in 1938. Both in production and manufacture of tobacco, however, Kentucky now is second to North Carolina. Sales on the Kentucky open markets in the season of 1938-39 amounted to 251,000,000lb. at an average price of 19.48



KEEN JOHNSON succeeded A. B. Chandler as governor of Kentucky in 1939

cents. In a referendum in November the tobacco planters endorsed a national restrictions plan for 1940. The corn crop of 1939 was estimated at 70,400,000bu. compared with a ten-year average of 62,688,000 bushels. Irish potatoes yielded 3,864,000bu. compared with 4,635,000bu. in 1938. The apple crop was disappointing—only 300,000 bushels. There was some increase in the production of wheat and sorghum. Of the varied mineral resources, which include rock asphalt and fluorspar especially, the chief commercial output is coal. In 1938 this industry employed 55,418 men who produced 39,689,449 tons. The loss of life was only 98 as compared with 141 in 1937. Petroleum lifted increased to 5,777,058bbl., due in part to new wells in Davies county. The natural gas yield was estimated at 38,000,000,000 cubic feet.

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Kentucky Dam: see TENNESSEE VALLEY AUTHORITY.

Kenya: see BRITISH EAST AFRICA.

Kidnapping. The number of kidnappings in the United States during 1939 was the lowest since 1934 and represented a marked decline from the number recorded in 1938. The annual total of kidnappings jointly investigated by the Federal Bureau of Investigation and by State and local police, under the terms of the Federal Kidnapping Act of June 22, 1932, appears in the table on p. 389. Since the purpose of kidnapping may be the extortion of ransom, or may be motivated by some quite different crime, such as rape or robbery, the table shows the total number of kidnappings, and also the number wherein ransom was demanded for the release of the victim.

All but two of the foregoing cases have been solved. Prosecu-

tions in Federal and State courts have resulted in the conviction of 328 defendants. The sentences imposed included nine death sentences, 45 sentences for life, and others for varying terms totalling 3,790 years. During this same eight-year period, two kidnappers were lynched, five committed suicide, and seven were murdered. Eight others were killed under varying circumstances.

On Dec. 19, 1939, eighteen persons were under indictment for

Year	Total Number of Kidnappings	Number Wherein Ransom Demanded
1932	5	5
1933	14	10
1934	18	5
1935	26	1
1936	31	1
1937	20	4
1938	37	5
1939 (to Dec. 19)	19	0
Total	170	31

violations of Federal kidnapping statutes. Some of these persons were already serving sentences for other crimes. Active participation by the Federal Bureau of Investigation continues to be the most important factor in the suppression of kidnapping in the United States. Official reports of kidnapping in England and Wales are confined to stealing children under 14 years of age. The record since 1900, summarized from available official sources, is as follows:

Five Year Averages	Annual Totals
1900-1904	15
1905-1909	10
1910-1914	7
1915-1919	8
1920-1924	4
1925-1929	4
1930-1934	5

Unusual kidnappings of the year included the seizure of the Rev. J. H. Goldner, and his son, the Rev. G. R. Goldner, American missionaries, by Arab bandits in Palestine on July 20, 1939. Upon release of the elder Goldner, he offered to pay the ransom demanded and his son was subsequently released.

Frank Poletti, Italian postal commissioner, was kidnapped in Peiping on Jan. 10, 1939. Ransom was paid through the Italian Embassy.

H. F. Dyott, Chairman of the British Chamber of Commerce, was seized by bandits at Tientsin, March 18, 1939 and held for ransom.

O. Lampe was kidnapped by bandits April 29, 1939, at Guanaquato, Mexico; his family received a demand for ransom on the following day.

With the arrest of five Japanese and one Mexican in Los Angeles on July 30, it was announced that an international kidnapping ring had thereby been broken. (See also FEDERAL BUREAU OF INVESTIGATION.)

BIBLIOGRAPHY.—*Federal Bureau of Investigation Law Enforcement Bulletin* (monthly) for 1939, (Federal Bureau of Investigation, Washington); *Criminal Statistics, England and Wales, 1937*, (Home Office, London, 1938). (Br. S.)

Kingsley Dam: see DAMS.

Kirghiz S. S. R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Knights of Columbus. At the 57th annual meeting of the Supreme Council, held in Seattle, Wash., August 15-17, Francis P. Matthews, of Omaha, Neb., was elected Supreme Knight, in succession to Martin H. Carmody, who had held that office since 1927. John E. Swift, of Milford, Mass., was chosen Deputy Supreme Knight. Joseph F. Lamb, of New York, N.Y., was named Supreme Secretary, replacing William McGinley who had served since 1909. Rev. Leo M. Finn, of

Bridgeport, Conn., is Supreme Chaplain. The national offices are located at New Haven, Conn.

Success attended the efforts made during 1939 to develop study clubs, forums and other activities of a cultural and intellectual nature. Particular emphasis was laid upon the crusade against atheistic Communism and other subversive movements in the United States. A positive crusade was undertaken to promote a better understanding of the remedies offered by the recent popes, in their encyclicals, for the social and economic reform of society. Catholic Action was advanced through the lectures of Paul McGuire of Australia, and others who toured the country, and through the wide distribution of Catholic literature dealing with Christian social reconstruction. Notable advances were also made in the Boy Life Bureau. The total membership for the current year is 417,150. The insurance membership numbers 218,491. Of the 39,618 members initiated during 1939, 14,391 were insurance members. The amount of life insurance applied for during 1939 was \$18,902,000, an increase over the 1938 figure of \$13,612,000. Insurance benefits totalled \$2,998,221, as against \$2,874,368 in the preceding year. There are now, in active condition, 2,470 Councils, located in every State of the Union, in the Dependencies, and in Canada.

Organized in 1882, this fraternal and benevolent order is dedicated to strengthening and defending Catholic principles. Membership is limited to Catholics in good standing. The official publications include *Columbia*, a monthly, and a *News Weekly*.

(F. X. T.)

Korea: see CHOSEN.

Krupskaya, Nadezhda Konstantinovna (1869-1939), Soviet educationalist and widow of Lenin, was born in St. Petersburg on February 26, the daughter of an impoverished army officer who died when she was a young girl. With the money she had earned as a tutor she studied for five years at the new Woman's college in St. Petersburg and graduated with distinction. From 1891 to 1896 she taught geography in Sunday schools, during which period she became a fervent convert to Marxism. She met Lenin in 1893 and with him was exiled to Shushinsk, Siberia, after she had participated in a workers' strike in 1896. They were allowed to marry in 1898, and after their release from Siberia the next year they went to Munich, where Krupskaya helped her husband organize secret revolutionary units in Russia. They were permitted to return to Russia in 1905 but were ejected again in 1908, whereupon they continued their underground activities in Prague, Paris and Cracow—Krupskaya in the meantime studying pedagogy. When Kerensky was overthrown and Lenin installed in power, Krupskaya became a member of the people's commissariat of education and drafted the party's plan for popular education. In Jan. 1938 she was elected to membership in the Presidium of the U.S.S.R.; she was also a member of the central committee of the communist party and vice commissar of education. As Lenin's widow she was revered throughout Russia despite several well-known disputes with Stalin; and her 70th birthday, the day before her death, was the occasion for a popular celebration in Moscow. She died in her apartment inside the Kremlin wall on February 27.

Kurdistan: see TURKEY.

Kuwait: see ARABIA.

Kyanite. Its adaptability for the production of special high temperature refractories has led to a gradual increase in the demand for kyanite, which has been supplied by produc-

tion from North Carolina, Georgia, Virginia and California, and by imports from India, where production amounted to 29,231 long tons in 1937. Imports into the United States were 3,964 short tons in 1937, all from India. The related minerals, sillimanite and andalusite, which have the same chemical composition as kyanite, but a different crystal structure, are also used for the same purpose.

(G. A. Ro.)

Labor, U.S. Department of: see GOVERNMENT DEPARTMENTS AND BUREAUS.

Labour: see AMERICAN FEDERATION OF LABOR; CIVIL SERVICE; CONGRESS OF INDUSTRIAL ORGANIZATIONS; INITIATIVE AND REFERENDUM; LABOUR UNIONS; LAW (CASE): *Labour*; RELIEF; STRIKES AND LOCK-OUTS; SUPREME COURT OF THE UNITED STATES: *Labour*; UNEMPLOYMENT; WAGES AND HOURS; UNITED STATES: *Labour Problems*; MOTION PICTURES; COTTON: *Employer-Employee Relations*; NEGROES (AMERICAN); RADIO, INDUSTRIAL ASPECTS OF. See also under various States.

Labour Party. The 38th annual conference of the British Labour Party was held at Southport at Whitsuntide, 1939. The issues before it related to the international situation and to the movement for a "Popular Front" headed by Sir Stafford Cripps, who, with certain of his leading followers, had been expelled from the party for defiance of "party discipline" in collaborating with members of the Liberal and Communist parties in a campaign against the official policy. Sir Stafford Cripps was allowed to appear and state his case; but a proposal to endorse the "Popular Front" was overwhelmingly defeated by 2,360,000 votes to 248,000. The expulsions therefore stood; but except for Sir Stafford Cripps most of the expelled members have since been re-instated.

On the international situation, the conference carried almost unanimously a resolution in favour of a pact of mutual aid against aggression, to be based on a triple pact between Great Britain, France, and the Soviet Union. It also protested strongly against the betrayal of Czechoslovakia and the failure of the British Government to check Fascist intervention in Spain and Japanese aggression in China. On the outbreak of war the party, in conjunction with the Trades Union Congress General Council, strongly supported the policy of resistance to Nazi aggression, but refused to join a coalition government. It agreed, however, for the time being to an electoral truce, and also to legislation dispensing with elections to local authorities, for the war period.

The leader of the parliamentary Labour Party, C. R. Attlee, was away ill through the early months of the war, and his place was taken by Arthur Greenwood. Late in 1939, however, Mr. Attlee returned to his leadership; and he was duly re-elected leader for 1940.

At the end of 1938 the Labour Party had a national affiliated membership of 2,642,618, as against 2,527,672 a year previously. Individual membership of the constituency parties, which numbered 614, reached 250,705 men and 178,121 women—a reduction on the totals for the previous year (258,060 and 189,090). The affiliated trade union membership was 2,170,408, as compared with 4,669,000 represented at the 1939 Trades Union Congress. The proportion of "contracted-in" trade union members (*i.e.*, members paying the political levy) thus averages under one-half; but there are wide differences between trade unions in this respect, the unions of less skilled workers having on the whole considerably higher percentages of Labour Party members than the craft unions.

Over most of Britain, the Labour Party's policy of support for the war has been endorsed by the local parties. There is, however, evidence of fairly strong pacifist opposition in parts of Scot-

land. During 1939 the Communist Party ordered its "secret" members who had been occupying official positions in the Labour Party to withdraw from it, presumably as a preparation for the impending change in communist international policy. This caused a few local resignations of some importance; but neither this factor nor the troubles arising out of the Cripps "Popular Front" campaign seriously affected the internal organization of the party.

(G. D. H. C.)

Labour Unions. Labour developments in 1939 reflected the marked improvement in business which began the year before and the political influence on organized labour of the approaching presidential election of 1940. Labour relations were much more disturbed than in 1938 and the number of employees engaged in strikes substantially increased. No successful contribution to peace within the labour movement resulted from efforts of the President of the United States to compose the differences which continued to divide the C.I.O. and the A.F. of L. The National Labor Relations Board and the law which it administers were vigorously attacked by the A.F. of L. and the employers, and were made the subject of a far-reaching investigation by a special committee of the House of Representatives. Because of this investigation, charges brought against a number of unions for violation of the anti-trust laws, and local reactions against organized labour, there were indications during the year of the possibility of material revision of the National Labor Relations Act and, perhaps, of the whole labour policy of the Federal Government.

The leading strikes—the industry-wide shut-down of the bituminous coal industry and the prolonged strikes in the plants of the General Motors and Chrysler corporation—were aimed primarily toward strengthening the positions of the United Mine Workers and the United Automobile Workers. The miners' union, the dominating organization in the C.I.O., sought to protect itself against the Progressive Miners, the union of coal miners affiliated with the American Federation of Labor. In several important regions of the coal industry, notably Harlan county, Kentucky, as well as Kansas and Oklahoma, the Progressive Miners were making considerable headway among the miners, were chartering new locals, and, in some cases, taking over local unions affiliated with the United Mine Workers. These tactics and the fears they engendered forced the United Mine Workers to modify their traditional policy and demand arrangements tantamount to a closed-shop. In the negotiations for the renewal of contracts, held in the spring of 1939, this demand precipitated a general shut-down of the coal mines and a prolonged strike, which was settled only after presidential intervention on May 11. The United Mine Workers won their principal demand, protected themselves effectively against the Progressive Miners, and in the process obtained union contracts in hitherto unorganized parts of the industry.

Similar considerations accounted for the General Motors strike of July and the Chrysler strike of Oct. 1939. In this industry the union of automobile employees, though claiming a large membership, had won only limited recognition from the Chrysler and General Motors companies, and was not at all recognized by the Ford Company. As a result, further, of dissension within the union an important faction had broken away and become affiliated with the A.F. of L. To protect itself against this rival union as well as to strengthen its ties with its members, the United Automobile Workers, affiliated with the C.I.O., made extensive demands upon General Motors. When these were denied by the company, a strike was called. Several months later restrictions of output (slow-downs) practiced by members of the union, caused the shut-down of the Chrysler plants and initiated a strike of nearly two-months' duration. In the negotiations for the settlement of this, as of the General Motors strike, the basic union

demands were concerned with establishing the union as the sole and permanent labour organization in the industry. Although the union received minor concessions in both settlements, on the main issues of the closed-shop and the union's control over the shops its demands remained unsatisfied.

On a minor scale, the C.I.O. union of seamen attempted to win the same concessions by demanding from shipping companies on the East coast control of hiring-halls. When these demands were denied, the union struck against a number of the companies, including the Standard Oil Companies of New Jersey and New York and the Texas Company. The strike was lost and the union, for the time being, eliminated from the ships of these companies. These efforts to turn the better business of 1939 to union account greatly increased the time lost through strikes. It is clear that the number of man-days lost was more than double that of 1938, substantially exceeded the number in 1936, but fell appreciably short of 1937—the most disturbed year in the recent period of union organizing activity and labour unrest.

How much progress organized labour made during the year it is becoming increasingly difficult to determine from the reports published by the two leading federations of labour. The C.I.O., for reasons of strategy, failed to submit the usual financial statement to its annual convention and, therefore, to make available the only satisfactory data for checking its claims of membership. The A.F. of L., whose financial statement was issued as in the past, claimed a further substantial increase in the membership of affiliated organizations. In their struggle for members, the A.F. of L. appears on the whole to have made the most progress. The United Textile Workers, one of the original group of Federation unions to join the C.I.O., abandoned that organization and was readmitted into the A.F. of L. The Ladies Garment Workers, another union of the same class and one of the largest unions in the country, has quite definitely withdrawn from the C.I.O. and is reported to be considering reaffiliation with the Federation. In the automobile industry, the A.F. of L. now has a union of its own, which, though small, is in a position to make trouble for the C.I.O. union and to grow at its expense. Both federations are doubtless suffering from the rise of a considerable number of plant and local unions, unaffiliated with either the A.F. of L. or the C.I.O., whose number and importance is increasing throughout the U.S.

The growing tension between the C.I.O. and the A.F. of L., which characterized their relations during 1939, rendered unlikely an early peace and amalgamation of the two factions. The promising negotiations of the spring, initiated by the President, were adjourned for the duration of the miners' strike and were never resumed. The messages sent by the President to the two annual conventions of these organizations, held in the fall of the year, were aimed to force a resumption of these conversations. But, although the messages were acknowledged, there was apparently no agreement to hold a new conference and it is the general opinion that the two organizations are further apart than at any time since their initial rupture in 1935. In fact, the latest step taken by the C.I.O. in organizing rival unions in the building industry seems calculated to make a settlement all but impossible.

The chief sufferers from this dispute were the Labor Relations Board and the Wagner Act. Opposition by the A.F. of L. to the board's policies and personnel prevented the confirmation by Congress of a member of the board, nominated for reappointment by the President. In his place the President appointed W. M. Leiserson, chairman of the railroad National Mediation Board, who shortly became a severe critic of the board's procedures and staff. The scope and vigour of the complaints made by the A.F. of L. were a powerful factor in promoting the latest Congressional investigation of this whole matter. This inquiry, begun in December by a House committee of which Congressman Howard W.

Smith is chairman, was preceded by thorough examinations of the board's records. The minutes of the committee's first sessions indicate that it has undertaken a searching review of the board's methods of operation and of the consequences of the Wagner Act.

The board meanwhile has made little change in policy. But it met many reversals, particularly in the lower courts. Two decisions late in the year rejected the board's findings that the company unions in question were employer dominated. A decision of fundamental importance by the Circuit Court of Appeals in the Inland Steel case not only reversed the Board by holding that the Wagner Act did not require an employer to make a written contract with the union but also severely criticized the board's handling of the whole proceedings. The United States Supreme Court has continued to uphold the decisions of the board. But this court, too, in the well-known *Fansteel* case, involving the rights of sit-down strikers, completely reversed the board's decision and refused to sanction an order requiring the reinstatement of sit-down strikers. (See also LAW [CASE]: *Labour*.)

The acts of trade unions were attacked also from another direction. In proceedings under the Sherman Anti-Trust Act, the Federal District Court of Philadelphia, in a decision issued April 3, awarded the Apex Hosiery Company damages of \$700,000 against the hosiery workers' union. The decision was reversed by the Circuit Court of Appeals on the grounds that the acts of the union were not obstructions to interstate commerce and has been appealed to the Supreme Court. No litigation since the famous *Danbury Hatters'* case has so aroused organized labour as has this threat to bring unions under the provisions of the anti-trust law. But not long thereafter the United States Department of Justice instituted proceedings under the same statute against unions in the building and trucking industries. These latest moves brought a strong protest from William Green, president of the A.F. of L. Attorney-General Murphy, however, asserted the department's intention to proceed with the indictments. (See also AMERICAN FEDERATION OF LABOR; CONGRESS OF INDUSTRIAL ORGANIZATIONS; STRIKES AND LOCK-OUTS.) (L. Wo.)

Great Britain.—Trade unionism in 1938 and 1939 continued its recovery from the effects of the world slump. In 1938 total trade union membership rose by 3.6% to 6,054,000. This was a much slower rate of advance than in 1937, when membership rose by over 10%, the fall in the rate of increase being due to the recession in industry. Complete figures are not available for 1939; but the Trades Union Congress which met in Sept. 1939 represented 4,669,000 members, as against 4,461,000 in 1938. Owing to war conditions, the congress met for only two days instead of the customary week, and most of the time was taken up with emergency questions, including a report on the international situation, in which the Congress declared its strong support of resistance to Nazi aggression. The General Council of Congress also received larger powers to deal with inter-union disputes and to undertake campaigns for increasing trade union membership. Owing to the scarcity of trade disputes, trade union funds increased during 1938, the accumulated balances of 426 registered unions amounting to over £20,000,000 at the end of that year, or twice as much as in 1928, when funds had been badly depleted in consequence of the general strike.

France.—The trade unions entered in 1938–39 on a period of increasing difficulty. In Nov. 1938 the unsuccessful attempt at a general strike against M. Reynaud's new decrees was followed by Government action against the strikers. A discretionary amnesty, subject to numerous exceptions, was approved by the Chamber in Feb. 1939; but a serious blow had been dealt to the power of the *Confédération Générale du Travail*. During 1939 there was increasing tension inside the unions between the communist and non-communist elements; and this tension became much more

acute when the Communist Party, on the outbreak of war, took up an anti-war attitude, and was outlawed by the Government. The leaders of the C.G.T., in common with the Socialist Party, took up a strong line against the communists, and at the beginning of October M. Léon Jouhaux, the C.G.T. secretary, demanded the elimination of all communists from positions of influence in the trade unions. By agreement with the Government, the election of delegates in the workshops was suspended for the period of the war, the delegates being nominated instead by the trade unions concerned. No recent figures of C.G.T. membership are available.

International Federation of Trade Unions.—The eighth Triennial Congress was held in July 1939, with Sir Walter Citrine as president. It announced a rise in membership from 13,000,000 to nearly 19,000,000 since the 1936 Congress, despite the loss of the affiliated movements in Czechoslovakia, Spain and Austria. The trade union movements of the United States (A.F. of L.), Mexico and New Zealand had meanwhile joined the I.F.T.U. The congress had before it a British motion recommending that the Russian trade union movement should be invited to affiliate to the I.F.T.U. This was supported by France, Mexico and Norway, but was defeated by 46 votes to 37, the American and Swedish delegates taking up an attitude of especially strong opposition. The congress, however, carried a resolution in favour of an Anglo-French-Russian pact against aggression, and adopted strong resolutions against racial persecution, and the suppression of industrial liberties in the Fascist countries, and in favour of a renewed agitation for a shorter working week. In October the Bureau of the I.F.T.U., meeting in Paris, unanimously supported the action of the British and French unions in helping to "defend liberty, democracy and civilization against the aggression of the totalitarian States."

The resolution went on to declare that peace could be restored only on a basis of respect for the rights of man and of the peoples to self-government. (G. D. H. C.)

Labrador: *see* NEWFOUNDLAND AND LABRADOR.

Laemmle, Carl (1867–1939), U.S. motion picture producer and executive, was born January 17 at Laupheim, Germany, and moved to the United States in 1884. After clerking in various stores in New York city and Chicago he managed a clothing house in Oshkosh, Wis., until 1906, when he opened a motion picture theatre in Chicago.

In the same year he founded the Laemmle Film Service. Moving to Hollywood, he began production of motion pictures, and in 1912 he merged the leading independent producers into Universal Pictures Corporation, of which he was president until 1936. He died at Beverly Hills, Calif., September 24.

La Guardia Field: *see* AIRPORTS.

Lambert, Alexander (1861–1939), U.S. physician and former president of the American Medical Association (1919) was born in New York city on December 15 and was educated at Yale and Columbia universities. In 1894 he became attending physician at Bellevue hospital, New York city, and a bacteriologist on the staff of the New York Health department. Four years later he was appointed professor of clinical medicine at Cornell university. Dr. Lambert was a leading authority on the treatment of alcoholism and drug addiction.

He died in New York city on May 9.

Land Banks: *see* FEDERAL LAND BANKS.

Langsdorff, Hans (1894–1939), German naval officer, was born March 20 at Bergen, on the Isle of Rügen. He joined the imperial navy as an ensign in April 1912 and was advanced to lieutenant three years later. During the battle of Jutland May 31, 1916, he saw action aboard the battleship "Grosser Kurfuerst" of the High Seas fleet. Later he commanded flotillas of minesweepers and torpedo boats. In 1935 he became chief of staff officers of the German Admiralty and in 1938 he was appointed commander of the pocket battleship "Admiral Graf Spee." After the European war began the ship shuttled between South America and Africa, raiding commerce and sinking nine British merchantmen. After an all-day battle with three British cruisers December 13 the "Graf Spee," badly damaged, put into the harbour of Montevideo, and four days later Langsdorff, upon orders from Hitler, blew up the ship (*see* EUROPEAN WAR). He then took his crew to Buenos Aires where, after internment, he shot himself to death December 20.

Laos: *see* FRENCH COLONIAL EMPIRE.

Latin America, also called Hispanic America, is the portion of the American continent deriving its culture and institutions largely from Spain and Portugal. Latin America includes 20 republics and the United States dependency of Puerto Rico. Spanish is spoken throughout, except in Brazil (Portuguese) and in Haiti (French). English is legally on a parity with Spanish in Puerto Rico. Indigenous languages and dialects are used by large numbers in some regions, particularly in Mexico, Central America, Ecuador, Peru and Bolivia. The area is approximately 8,050,000 square miles. The people are white, mestizo and Indian, with negroid elements predominant in the Dominican Republic and Haiti, and prominent in Brazil, Cuba and on the Caribbean coast. The population (1939 estimate) is about 114,000,000. The chief cities are: Buenos Aires, 2,345,221; Rio de Janeiro, 1,871,830; São Paulo, 1,167,862; Mexico City, 1,229,576; Santiago de Chile, 859,830. During 1939 no political changes were effected by force, although serious, abortive revolutions occurred in Peru and Bolivia. Impending presidential elections in Costa Rica, Cuba, Ecuador and Mexico, scheduled for 1940, gave rise to some political unrest, especially in the last two.

Outbreak of the European war in Sept. 1939 brought serious economic dislocation throughout Latin America, disrupting communications with European markets and preventing delivery of goods already ordered and paid for. An inter-American congress met at Panamá in September to discuss and plan joint action of all the American republics. Similar consultations on special problems were subsequently held. (*See* HISPANIC AMERICA AND THE EUROPEAN WAR.) The Latin American members of the League of Nations assumed leadership in forcing the expulsion of Russia from the League after her attack on Finland in December.

Every country except Bolivia has important agricultural resources, with wheat in Argentina, coffee in Brazil and the Caribbean States, and sugar in Cuba, the economic mainstays. The pastoral industry is outstanding in Argentina and Uruguay. Venezuela, Mexico, Colombia, Argentina, Peru and Ecuador are important for petroleum. Mexico and the Andean republics of South America are leading metal producers. Manufacturing is developing rapidly, but is inadequate for domestic needs, and manufactured goods and foodstuffs comprise the chief imports, with exports the respective leading products of each country. In 1937 the imports of the 20 republics aggregated approximately \$1,630,829,000, the exports \$2,396,054,000. The United States led in total trade, Great Britain was second, with Germany a close third. The Roman Catholic faith is predominant in all countries, with, however, a varying degree of relationship with the Church itself.

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Latter Day Saints: see MORMONS.

Latvia, area 25,016 sq.mi.; pop. (est. Dec. 31, 1938) 1,994,500. Chief towns (pop. 1935): Riga (capital, 385,063), Liepaja (57,098). President, Karlis Ulmanis; language, Latvian; religion, Christian (Protestant 55%, Roman Catholic 24.5%, Greek Catholic 9%, Greek Orthodox 5.5%).

History.—The whole of Latvia's national effort during 1939 was devoted to the preservation of her neutrality both before and after the outbreak of war in Europe. She already had a non-aggression pact with Russia, and on June 7 she balanced this by signing a similar pact with Germany. While negotiations between Russia and the Western democracies were still in progress, Latvia made no secret of her dislike of the Soviet proposals for guaranteeing her neutrality; but after the conclusion of the Russo-German pact and the collapse of Poland, Latvia fell into line with the other Baltic States by acceding to Russia's demand for naval bases at Liepaja and Ventspils and for aerodromes and artillery bases on Latvian territory. The Soviet-Latvian pact was signed on October 5 (see also UNION OF SOVIET SOCIALIST REPUBLICS). The Government had called up some reservists on September 8, and on September 28 a state of emergency had been proclaimed and the setting up of a council of defence decided upon; but on November 8 the reservists were ordered to be disbanded.

On October 30 an agreement was reached with Germany regarding the repatriation to the Reich of German Balts and the disposal of their property. The affected German minority in Latvia amounted to some 62,000.

Education.—In 1938-39: elementary schools, 1,895; scholars, 229,825; secondary schools 114; scholars 25,225.

Banking and Finance.—Revenue (est. 1939-40) 198,852,000 lats; expenditure (est. 1939-40) 198,696,000 lats; public debt (June 1, 1939) 146,491,000 lats; notes in circulation (July 31, 1939) 81,001,000 lats; gold reserve (July 31, 1939) 97,869,000 lats; exchange rate (up to Sept. 12, 1939) 25-22½ lats=£1 sterling.

Trade and Communication.—Foreign trade (merchandise): imports, total (1938) 227,336,000 lats; (Jan.-June 1939) 118,340,000 lats; exports, total (1938) 227,204,000 lats; (Jan.-June 1939) 117,830,000 lats. Communications 1939: roads, suitable for motor traffic 1,715mi.; railways, open to traffic 2,081mi.; inland waterways 2,776mi.; motor vehicles licensed (Jan. 1, 1939): cars 3,399; trucks and buses 3,188; cycles 3,357; wireless receiving set licences (April 1, 1939) 140,099; telephone subscribers (April 1, 1939) 76,436.

Agriculture and Industry.—Production 1938 (in metric tons): oats 446,600; (1939) 450,300; rye 378,700; (1939) 429,700; barley 220,600; (1939) 209,000; wheat 191,000; (1939) 198,700; potatoes 1,751,400; flax and hemp (fibre) 21,500; beet sugar 33,300; wood pulp 41,200. Industry and labour: factories (1938) 5,977; employees (average 1938) 110,546; industrial production (1929=100) (average 1938) 174.5; (June 1939) 175.5; index of employment (1929=100) (average 1938) 144; applicants for work (average 1938) 2,164; (Aug. 31, 1939) 446.

Lavelle, Michael J. (1856-1939), American priest, rector of St. Patrick's cathedral in New York city for 52 years, was born in New York city on May 30 and was educated at Manhattan college and St. Joseph's seminary, Troy, New York. He was ordained to the priesthood in 1879 and named

rector of the cathedral in 1886. In 1902 he was appointed vicar general of New York and the next year domestic prelate to Pope Pius X. He died at New York city on October 17.

Law (Case). The following cases, decided during 1939, have been selected to represent the crystallization of the more important rules of American law.

Agriculture.—Emphasizing the trend toward governmental regulation, upheld by the Supreme Court, several tribunals have sustained agricultural legislation which, heretofore, would have been deemed illegal because of its price-fixing features. This phase of control is applicable to intrastate handlers of milk on the theory that the distribution of a substantial amount of milk in an area outside of the regulation would seriously interfere with and adversely affect the regulation of the interstate handling of milk undertaken by the Secretary of Agriculture (*U.S. v. Andrews*, U.S.D.C., D. Mass., January 18). Similarly validated were the Marketing Agreement Act of 1937 (*U.S. v. Krechting*, U.S.D.C., S. Ohio, February 17), and a California statute providing for such regulation (*In re Willing*, January 18). But Florida's so-called Grower's Cost Guarantee Law of 1935 providing for the regulation of marketing of citrus fruit produced in the State is unconstitutional insofar as it provides for the establishment of the cost of production as the minimum price at which the fruit may be sold: such regulation being arbitrary and in violation of the due process clause of the constitution (*Lakeland Highlands Canning Co., Inc. v. Mayo*, U.S.D.C., S. Florida—three judge court—May 3).

Aliens.—The influx of refugees into the country has given rise to a number of problems pertaining to the rights of aliens. Outstanding are the right to come in under the Immigration Act of 1937 and liability to deportation.

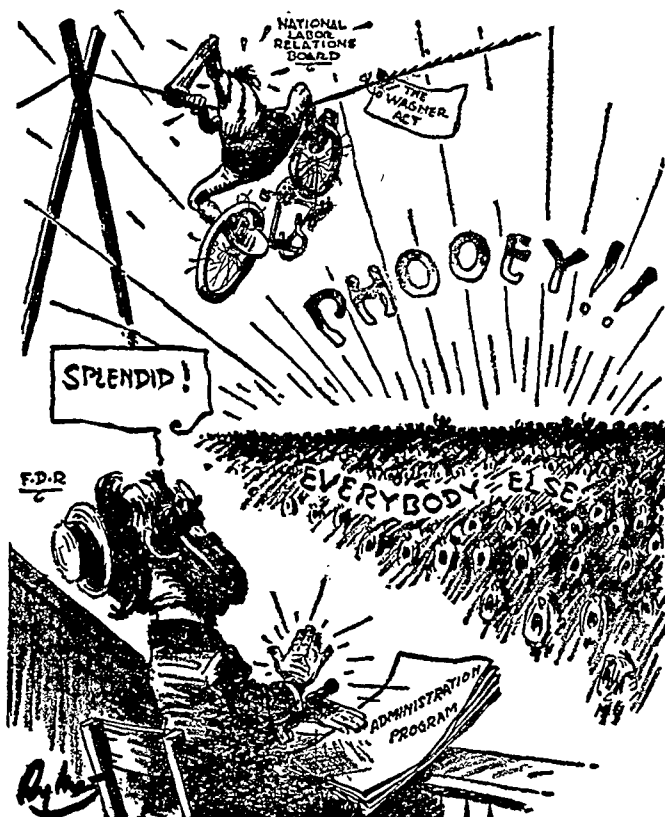
Although under normal circumstances willful false swearing would involve moral turpitude, in the opinion of the attorney-general (Dec. 31, 1938, released Jan. 9, 1939) such offence did not bar a German refugee who was convicted by a German court of knowingly making a false statement in a report required by the German Real Property Law (*Opinion No. 59*—vol. 39 of Attorney-General). A native born citizen of the United States did not lose her citizenship because of her removal during minority to Sweden where her parents resumed their citizenship in that country. Such native, having returned to the United States within a reasonable time after attaining her majority with intention to remain and maintain her citizenship here, continues to enjoy that citizenship unless she was deprived of it through operation of a treaty, or congressional enactment, or by voluntary action (*Perkins v. Elg*; *Elg v. Perkins*, nos. 454-5, May 29). The Circuit Court of Appeals decided in a novel case that the revocation of a visa after the embarkation of an alien is unauthorized although it is based on fraud in obtaining the visa. The Consul who issued the passport relied on a misrepresentation that the alien was not accountable. The alien denied such facts on his arrival. The court held that he could not be excluded solely on the ground that the visa had been revoked but is entitled to a hearing on the merits before a board of special inquiry on the question whether he obtained the visa by fraud (*Strachey, U.S. ex rel v. Reimer*, January 23).

Anti-Trust.—Under the anti-trust law, treble damages are allowed the injured plaintiff in a civil suit. Simultaneously with the Government's numerous anti-trust suits, many of these treble damage actions have been brought by private suitors. A novel aspect of this method of enforcement of the Sherman Act was involved in a case decided by the Circuit Court of Appeals for the second circuit. A distributor of a certain product, who had been selling it at a price lower than that fixed in a price maintenance agreement, and as a result had been deprived of his supply of the

product, was permitted to sue the producer and other distributors for treble damages even though he originally was a party to the combination to restrain trade in violation of an anti-trust act by a price agreement (*Connecticut Importing Co. v. Frankfort Distilleries, Inc.*, January 9). The major anti-trust activities, however, have been suits by the Department of Justice and the attorney-general's office to curb such practices by compelling industries to enter consent decrees under which they were enjoined from the continuance of such practices. This so-called method of "potential" anti-trust actions has been deemed more effective and far-reaching than actual indictments. Wherever a governmental investigation is undertaken, illegal practices, it is noted by the assistant attorney-general, have become less, and profiteering eliminated. The turn in anti-trust suits has been away from injunctions and more towards the criminal action. The oil companies indicted in *U.S. v. Socony Oil Co., Inc.* (C.C.A. 7, July 27), General Motors Corp. (*U.S. v. General Motors Corp.*, U.S.D.C., N.D. Indiana, November 15), and *U.S. v. Aluminum Co. of America* (U.S.D.C., S. N.Y., November 1) have brought to a close a series of actions in which the Government has been highly successful. In the General Motors case the corporation (as in oil and aluminium) was convicted of conspiring to violate the anti-trust laws, but all the individuals in that case were acquitted of that charge.

Constitutional Law.—A statute providing for flag salute by pupils of public schools is constitutional and does not violate the due process clause of the 14th Amendment as to pupils who sincerely and honestly believe, in accordance with the doctrines of their religious sect, that such salute is a form of idolatry (*Johnson v. Town of Deerfield*, U.S.D.C., D. Mass.—three judge court—January 4). A New York statute making the presence in an automobile of any weapon presumptive evidence that all persons in the automobile at the time the weapon was found therein are guilty of illegal possession of the weapon is constitutional. Such statute is not unlike placing a similar burden on others discovered in the possession of stolen goods, burglar's tools, proceeds of larceny, intoxicating liquors, etc. (*N.Y. v. Burt*, N.Y.C. Ct., Queens County, March 18). The New Jersey Gangster Act provides that "any person not engaged in lawful occupation, known to be a member of any gang consisting of two or more persons who has been convicted at least three times of being a disorderly person, or who has been convicted of any crime in this or any other State is declared to be a gangster." This act was declared unconstitutional because the terms of the statute "are so vague, indefinite, and uncertain as to deny the due process of law guaranteed by the 14th Amendment of the Constitution" (*Lanzetta, etc., et al. v. State of New Jersey*, No. 30, March 27). A statute subjecting all income of domestic corporations doing business within and without a State to a tax is unconstitutional in view of the fact that domestic corporations doing business in other States are exempt (*Mc Carroll v. Gregory-Robinson-Speas, Inc.*, Ark. Sup. Ct., April 11).

Domestic Relations.—The attitude toward the migratory divorce, particularly of Mexican origin, is reflected in the recent decision of the U.S. Court of Appeals, District of Columbia, which refused to recognize a Mexican divorce despite the fact that both husband and wife joined in procuring it (apparently by mail order). Since neither party was domiciled in Mexico nor personally present there, there was no basis for the Mexican court to exercise any jurisdiction (*Garman v. Garman*, January 30). The Ohio Court of Appeals has ruled that a husband whose wife was employed in a gainful occupation although he was able to provide her with a suitable home, was not entitled to divorce on the ground of gross neglect of duty. Nor was the court impressed by his claim that business worries incident to her work made her irritable, unpleasant, and quarrelsome (*Winnard v. Winnard*, November 8). The Oregon Supreme Court takes a more liberal position, allowing



"A SLIGHT DIFFERENCE OF OPINION" concerning the performance of the National Labor Relations Board existed in 1939, notes Sykes of *The Boston Transcript*

divorce where the wife's frequent statements to her husband that she had ceased to care for him and did not wish to live with him were deemed "personal indignities" rendering the husband's life "burdensome" within the meaning of the Oregon statutes (*Neely v. Neely*, October 3). A novel guardianship statute, providing that sexually irresponsible persons are to be held subject to commitment and treatment in guardianship proceedings has been upheld by the Minnesota Supreme Court. Persons having a "psychopathic personality" are proper subjects for guardianship (*Pearson, State ex rel.*, Probate Court, June 30). Under the common law, husband and wife could not sue each other on the theory of union of personalities. With the coming of women suffrage and the recognition of equality, modern statutes have been granting them the same rights enjoyed by males. Accordingly, the U.S. Court of Appeals for the District of Columbia has allowed a wife to maintain an action for defamation against her husband and other persons who had conspired with him falsely to charge her with adultery (*Ewald v. Lane*, March 13).

Housing.—Indiana and California have upheld State housing legislation designed to make available to local housing authorities Federal aid provided for by the U.S. Housing Act. The unanimity with which State courts have upheld such legislation is significant in view of the constitutional objections which have been invoked in attacking such statutes. It is now clearly established, at least under State constitutions, that slum clearance and low-rent housing projects are in furtherance of a public purpose although the immediate benefit is limited to a particular group—persons of low income (*Edwards v. Housing Authority of City of Muncie, Indiana*, Sup. Court of Indiana, March 13; *Housing Authority of County of Los Angeles v. Dockweiler*, California Sup. Ct., October 11).

Insurance.—A commercial aeroplane passenger killed in a plane crash did not die as a result of participation in aviation or aeronautics within the meaning of an excepting clause in a life insur-

ance policy (*Massachusetts Protective Assn., Inc. v. Bayersdorfer*, C.C.A. 6, June 28). The Supreme Court of Minnesota holds that a person suffering from diabetes is entitled to disability benefits under a life policy even if he refuse to submit to medical treatment which would improve his health to the extent that he would be able to work (*Miller v. Mutual Life Insurance Co. of N.Y.*, November 3). The lay-off of a factory worker because of lack of work does not in the opinion of the Wisconsin Supreme Court, affect the continuity of his employment within the meaning of a group insurance policy even though the lay-off continues for six months (*Garusky v. Metropolitan Life Insurance Co.*, October 10). The double indemnity clause of a life insurance policy insuring against injury and death "by the collapse of the outer walls or burning of a building if the insured is therein at the time of the collapse or commencement of the fire," was applicable to the death of the insured as a result of burning of an automobile trailer, the trailer being a "building" within the meaning of the policy (*Aird v. Aetna Life Insurance Co.*, U.S.D.C., W. Texas, March 6).

Labour.—Labour has profited and lost by the divergent tendencies expressed in legislative, executive and judicial circles. An outstanding development in this heavily litigated field has been the official pronouncement by the attorney-general's office that labour unions are subject to criminal prosecutions under the anti-trust laws whenever the objective of a strike, boycott, or other concerted activity has no reasonable connection with a legitimate labour purpose such as wages, hours, safety, or collective bargaining. In the significant case of *Leader v. Apex Hosiery Co.* (C.C.A. 3, November 29) the Third Circuit Court of Appeals held that a sit-down strike in the manufacturing plant of the company did not restrain interstate commerce within the meaning of the statute although the company buys all of its raw materials and ships 80% of its completed merchandise in interstate commerce, and though manufacturing operations were disrupted for a period of six weeks. On the other hand, the court for the Seventh Circuit, held that picketing of retail milk stores in the city of Chicago constituted restraint of interstate commerce in view of the fact that the flow of interstate commerce in milk was retarded (*Lake Valley Farm Products, Inc. v. Milk Wagon Drivers' Union*, C.C.A. 7, November 29).

The widening application of the Labor Act has radically altered former concepts of interstate commerce. Although for the first time in its history of almost five years the Labor Board formally dismissed a proceeding for lack of jurisdiction. It found that commerce is not affected by (1) Interstate shipment of \$15,000 worth of goods which is three-tenths of 1% of the company's total sales (*In re San Diego Ice & Cold Storage Co.*, NLRB nos. C-436, R-499, November 9); (2) Operations of a taxicab company which receives two-tenths of 1% of its revenues from interstate business (*In re Yellow Cab & Baggage Co.*, NLRB no. C-1098, November 19).

In determining whether labour has been permitted to bargain collectively without molestation from employers, the Board has continued its policy of scrutinizing every arrangement and concession by the employer to detect domination, coercion, or persuasion. Where the bargaining was originated by the employer's chief officers, the Circuit Court held the Board justified in finding domination (*Virginia Ferry Co. v. NLRB*, C.C.A. 4, January 9). Courts have been willing to uphold the board even though there was small substantial interference with the employee organization (*Cudahy Packing Co. v. NLRB*, C.C.A. 8, March 27). Where, however, evidence did not show "wilful refusal" to negotiate with a representative as to wages, hours, and conditions of employment, the board's order was set aside (*Globe Cotton Mills v. NLRB*, C.C.A. 5, March 30). But an employer's refusal to co-operate in establishing a union's majority status was held by the board to consti-

tute a refusal to bargain collectively (*In re Stehli & Co., Inc.*, NLRB no. C-463, March 30). Even though a strike be clearly premature, an employer's refusal to bargain collectively is held to prolong it and his failure to reinstate strikers was a discrimination in violation of the Wagner Act (*In re Bennett-Hubbard Candy Co.*, NLRB no. C-609, March 13).

The Wagner Act does not prevent an employer from discriminating in hiring (*NLRB v. National Casket Corp.*, C.C.A. 2, December 11). But the fear that union employees will engage in a sit-down strike justified an employer in replacing the employees, where under the circumstances the employer's suspicion was well founded (*In re Calmer Steamship Corp.*, NLRB no. C-417-26, C-428, December 1).

The reaction to labour's growing power, its insubordination and the immunities it enjoys by virtue of the anti-injunction statutes stemming from the Norris-La Guardia Act back in 1932 have given rise to a flood of anti-picketing ordinances and statutes which have, in the main, been upheld (*Swing v. A.F. of L.*, Ill. Sup. Ct., June 19). Where, however, anti-picketing ordinances conflict with the State anti-injunction act obviously the latter will prevail. Under such a statute in the State of Washington an injunction restraining the doing of certain acts which involve a labour dispute may not be granted (*City of Yakima v. Gorham*, September 27).

In determining whether to order reinstatement, the board is governed by the *Fansteel* case (see SUPREME COURT OF THE UNITED STATES), i.e. the employee must not have been guilty of illegal acts (*Republic Steel Corp. v. NLRB*, C.C.A. 3, November 8).

In the matter of judicial review, the board has been censured by many courts for its findings and recourse to "background evidence" when in lack of more convincing proof that an employer has been guilty of unfair labour practices. Yet judicial review of the board's decisions, ruled the Circuit Court of Appeals and affirmed by the U.S. Supreme Court (see SUPREME COURT OF THE UNITED STATES), will only be allowed from a final order. The effect of this ruling is to grant absolute power over an important segment of labour board decisions, namely, over matters of certification of representatives and the conduct of elections in determining the appropriate unit of bargaining (*A.F. of L. v. NLRB*, U.S. Ct. Appeals, D.C., February 27).

Securities.—A buyer of securities who was not furnished a prospectus may bring a civil action under the Securities Act of 1933 only if the particular sale was made through the mails or in interstate commerce (*Farrel v. Reynolds*, N.Y. Sup. Ct., February 24). The United States Court of Appeals for the District of Columbia held that a registration statement filed under the Securities Act of 1933 could not be withdrawn without the consent of the Commission after the statement had become effective and the Commission had instituted stop-order proceedings (*Resources Corp. International v. Securities & Exchange Commission*, February 27). Reports of National bank examiners to the comptroller of the currency may be furnished by the secretary of the Treasury to the SEC, for its use in connection with its inquiry into the financial condition of a bank whose stock is owned by a holding company being investigated by the Commission on charges of fraudulent statements in securities registration. Such reports, however, the court held, may not be introduced in evidence by the Commission at its hearings or otherwise made public (*Bank of America National Trust and Savings Association v. Douglas*, U.S.D.C., D.C., January 31).

Social Security.—A foundation created by a will has been held exempt from payment of social security taxes although it has granted donations of trust funds to employees and invested trust funds in a housing project (*Linderman v. Discoll*, U.S.D.C., W.Pa., February 15). An employer-employee relationship exists for social

security purposes in the case of contracts between a manufacturing company and truck drivers (*Jack & Jill, Inc. v. Tone*, Conn. Sup. Ct. of Errors, December 6); physicians devoting full time in clinic (S.S.T. 363, May 8); sales clerks trained by employee service company (S.S.T. 377, October 16); and students of high school placed in vocational training (S.S.T. 356, March 20). Soliciting life insurance agents are not employees within the meaning of Connecticut Unemployment Compensation Act (*Northwestern Mutual Life Insurance Co. v. Tone*, Conn. Sup. Ct. of Errors, March 1, in which holding 29 States concur). A contrary view is maintained by the Colorado Supreme Court (*Equitable Life Insurance Co. of Iowa v. Industrial Commission*, October 16).

Torts.—Formerly the ultimate consumer had no recourse against a manufacturer for negligence in the production of a commodity because there was no privity of contract between the parties. Recent trends in the field of tort law point in the direction of allowing recovery. Accordingly, a cigarette manufacturer was held liable under California law for personal injuries suffered in smoking a cigarette in an action based on negligence in the fabrication of the cigarette (*Lape v. Liggett & Myers Tobacco Co.*, Cal. Sup. Ct., January 17). An automobile driver whose negligence caused a collision was held liable for injuries suffered by a bystander from a flying spare tire even though the driver could not have anticipated such injury. It is sufficient to hold him liable, said the court, if he should have anticipated an injury (*Sullivan v. Flores*, Texas Sup. Ct., October 18). An automobile passenger was held guilty of contributory negligence in asking the driver a question, thereby distracting his attention while the car was approaching a curve (*Brandau, State to use of, etc. v. Brandau*, Md. Ct. of App., May 17). Although the conventional distinction in the law of torts between mental and physical harm still plays a significant rôle (recovery being allowed for physical harm and generally denied for mental) the tendency of the law to ignore "mental" harm is diminishing. The law has long given redress in some circumstances for intended mental harm without attendant physical consequences. A collection agency which has been employed to collect an alleged debt may be held liable to the debtor for injuries suffered as a result of statements in letters causing him mental anguish and impairing his health (*Clark v. Associated Retail Credit Men of Washington, D.C., Inc.*, D.C., April 10, 1939). The Ohio Supreme Court denied recovery to a bus passenger who became ill as the result of fright when detained for a period of 30 seconds to two minutes between electrically operated folding doors, where the fright was not accompanied by contemporaneous physical injuries (*Davis v. The Cleveland Railway Co.*, Ohio Sup. Ct., May 17).

Trade Regulation.—The most essential issue in this field of control has been the acrimonious battle between independents and chains and independents and price-cutters. The battle against the chains was on the whole unsuccessful in 1939. Pennsylvania (*American Stores Co. v. Boardman*, Pa. Sup. Ct., June 19), Kentucky (*Great Atlantic & Pacific Tea Co. v. Kentucky Tax Commission*, Kentucky Court of Appeals, March 21), Georgia (*Southern Groceries & Co., Inc. v. City Council of Augusta, Ga.*, Superior Court, October 21; *Great Atlantic & Pacific Tea Co. v. City of Columbia*, Georgia Supreme Court, November 16), declared their chain taxes unconstitutional, insisting generally that the principle of equality and uniformity in taxation "is one of the cornerstones of our Constitution" and that the classification singling out chain stores for a heavy tax was arbitrary, unreasonable, and confiscatory. Colorado Supreme Court, on the other hand, extended to "agency" stores the chain store characteristic and held them subject to the multiple store licence fee (*Bedford v. Gamble Skogmo Inc.*, May 29).

The brokerage provision of the Robinson-Patman Act prohibit-

ing payment where no such service was genuinely rendered (*Oliver Brothers v. F.T.C.*, 102 F [2d] 263, March 25; *Great Atlantic & Pacific Tea Co. v. F.T.C.*, 106 F [2d] 667, September 22), is upheld, since the Supreme Court has refused to review the Circuit Courts' decisions.

The Fair Trade laws, enacted to prohibit predatory price-cutting on trade-marked commodities in free and open competition by permitting the manufacturer to determine his minimum resale price, has received wide judicial approval. North Carolina upheld the constitutionality of its act (*Lilly & Co. v. Saunders*, N.C. Sup. Ct., September 27). The New York Court of Appeals has held that a non-signatory to a Fair Trade contract was bound by the contract as though he were a party to it, if he had knowledge of its existence (*Porchester Wine & Liquor Co. v. Miller*, July 11). Florida, on the other hand, has declared its Fair Trade Act unconstitutional insofar as it was held to be binding on dealers who have not signed such contract although they had notice thereof. Such provision, the court held, was not within the scope of the title of the Act as required by the State constitution (*Bristol-Myers, Inc. v. Webb's Cut Rate Drug Co., Inc.*, Sup. Ct., April 14).

Loss leader laws prohibiting sales below cost have not been as successful in courts as have been Fair Trade laws. The former, savouring too much of price fixing, have been declared unconstitutional and unworkable (Michigan, Maryland, New Jersey).

Under the Wheeler-Lea Amendment, the Federal Trade Commission has intensified its campaign to eliminate unfair competition (*In re Laing, Harr and Chamberlain, Inc.*, F.T.C. No. 3725, November 5), receiving added encouragement by declaration of the act's constitutionality (*Ostler Candy Co. v. F.T.C.*, C.C.A. 10, August 30).

The Bituminous Coal Act of 1937, insofar as it provides for price fixing, was held a constitutional exercise of the commerce power of Congress (*City of Atlanta v. National Bituminous Coal Comm.*, U.S.D.C., Dist. Col., February 15). Furthermore, the National Bituminous Coal Commission in a proceeding under this law, to establish minimum prices and marketing rules and regulations, has the power (sect. 10 [a]) to make available for inspection and introduction in evidence the reports concerning costs which have been made by coal producers who are members of the Bituminous Coal Code (*Utah Fuel Co. et al v. National Bituminous Coal Commission et al*, No. 528, January 30). (See also BANKRUPTCY.)

(B. WE.)

Lawn Tennis: see TENNIS.

Lead. The nine chief lead-producing countries, with outputs in excess of 50,000 tons, supply nearly 90% of the world total, the remaining 10% being scattered among a large number of minor producers, only five of which, France, Italy, Poland, the United Kingdom, and Japan, produce amounts in excess of 10,000 tons. World production declined 33% from 1929 to 1932, and in 1937 had recovered to 97% of the former high; the 1938

World Production of Lead
(In thousands of metric tons)

	1929	1932	1936	1937	1938
Australia	177.3	189.2	200.6	234.4	235.7
Belgium	62.2	61.5	65.1	88.0	90.5
Canada	148.0	116.1	173.8	186.4	185.7
Germany	97.9	95.2	139.0	162.4	171.7
Burma	81.5	72.3	74.3	78.9	81.4
Mexico	248.8	130.3	218.3	231.2	242.7
Spain	133.3	109.8	46.6	30.0	36.0
U.S.S.R.	6.2	18.7	50.8	55.0	69.0
United States	624.2	251.7	362.9	426.3	344.4
World Total	1,756.8	1,179.7	1,493.6	1,719.6	1,705.0
Ex. U.S.	1,132.6	928.0	1,130.7	1,293.3	1,360.6

total declined by 1%, to 1,705,000 tons, while preliminary estimates for 1939 indicate some increase.

United States production dropped 19% in 1938, to 344,400 metric tons, but rose again in 1939 to 430,000 tons, an increase of 18%, which brought the output back to the 1937 level. Canada and Burma had little change in 1938, but dropped slightly in 1939. Germany had a small increase in 1938 and apparently again in 1939. Mexico had a small increase in 1938, but dropped sharply in 1939. All of the figures quoted for 1939 are estimates based on figures for from seven to ten months' operation, and therefore are only approximate. Since the outbreak of war on September 1, practically no information is available on European operations.

Consumption of lead in the United States is practically independent of both imports and exports, each of which amounts to less than 1% of the total. The Australian, Belgian, Canadian, Indian, Mexican and Spanish outputs are largely exported, there being a large surplus over local consumption demands; German production, although large, must be supplemented by imports, which amount to 40-50% of the production, which is itself partly from imported ores. The United Kingdom has only a small home output, and depends on imports, largely from Empire sources. (See also METALLURGY: *Lead*.) (G. A. Ro.)

League of Nations. Politically, in 1939, the League's role was that of uneasy spectator until December. Czecho-Slovakia and Memel were annexed by Germany and Albania by Italy. But the cases of the victims were not laid before the League. Nor was the League able to give China anything like the effective help which she repeatedly asked for against the aggression of Japan. The causes for this political weakness and inactivity lay in the past. Not a little was due to deliberate pressing and propaganda on the part of the axis States, who had been living openly in defiance of the League.

When the war broke out the principle that the League was concerned was recognized to the extent that belligerents notified the League of their declarations of war and the reasons therefor, while the neutrals notified their neutrality. No member of the League, not even Poland, requested intervention.

For some time the League had recognized the possibility of the outbreak of war. After the Czecho-Slovak crisis of Sept. 1938 plans were devised for constitutional adjustments within the League. An emergency committee with plenary powers was formed out of the supervisory commission, the keeper of the League's purse, together with the secretary general, M. Avenol, the director of the International Labour Organization, Mr. Winant (United States), former premier Colijn of Holland and M. Carton de Wiart of Belgium. A similar emergency committee was formed for the International Labour Organization. When war came, these committees at the request of some 40 states including non-members of the League, *i.e.* the United States and Brazil, determined that the League should carry on above all in neutral, non-controversial, technical matters, and should ensure that its organizations should be fully prepared for handling, as they had done successfully after the World War (1914-18), any of the special activities which war allows or demands. The League deputy-secretary-general, Sean Lester, summed up the League's position, in a broadcast to New York on Oct. 21, 1939, thus: "Three fields of activity lie before the League today; they are readaptation of its work to meet the needs of the present crisis, preparation of material for assisting the settlement which will eventually come out of the war, and examination of the economic conditions to be faced in the problem of reconstruction."

Preoccupation with technical problems was, however, interrupted by Finland's appeal to the League under Articles 11 and 15 of the Covenant, against Soviet Russia's aggression on December

2. Hitherto it had been deemed politically inadvisable for a Council or Assembly to be summoned—not least out of regard for neutrals with powerful neighbours who were hostile to the League. Now Council and Assembly met to deal with Finland's appeal. Action taken by the League took a mere four days. The Council first considered the appeal, and passed it on to the new 20th Assembly, who appointed a special "Finn" committee to deal with the dispute. The Soviet Government was invited to submit the dispute for settlement, a formality met by refusal. The Assembly thereupon adopted a report setting forth the facts and containing a resolution which urgently appealed to every member of the League to give Finland all the material and humanitarian help possible, the technical services of the League to be used in its organization; it stated that Soviet Russia had "by its own action placed itself outside the Covenant," and asked the Council to consider "what consequences should follow from this situation." The Council on the same day, December 14, repeated the Assembly's condemnation of Russia's actions. "It follows," concluded the Council's resolution, "that the Union of Soviet Socialist Republics is no longer a member of the League." The League's action, whatever the final consequences, was of great importance. Forty-three nations turned to the only existing machinery for the peaceful settlement of disputes and for action against a state which refused to use the processes prescribed for such settlement. The League pronounced a severe moral verdict against the aggressor state, expelled it from membership, and organized help for the victim.

The International Labour Organization showed that its tripartite character, uniting Governments, employers and workers for a common aim, is capable of facing social problems in a time of crisis as well as in normal times. Owing to the condition of "near war," the annual conference in June abandoned attempts to realize the 40-hour week immediately. But draft conventions and recommendations were adopted on road transport, contracts of employment to indigenous workers, and protection of migrant workers.

In November, a second conference dealing with South American labour problems was held at Havana. A message from President Roosevelt strongly urged that the war should not be allowed to lessen the work of the International Labour Organization. At Geneva the Organization concentrated on collection of information to enable it to answer questions on social problems arising out of the war. (See also INTERNATIONAL LABOUR ORGANIZATION.)

Determination to adapt its technical machinery to changing conditions led the League to set up an expert committee under Mr. Bruce. Its report in August proposed to set up a central committee of 24 to co-ordinate all the League's technical work, *i.e.* social and economic questions, which really concern the whole world.

Many League organizations worked steadily throughout 1939. The routine work of the Health Organization persisted with little change. At a full session in November the Health Committee prepared for concerted action with the Balkan states for prevention of diseases caused by war. The Mandates Commission held two sessions. It declared that the British Government's *White Paper* of May on the future of Palestine was not in accord with the accepted interpretation of the mandate. The League Council has still to pronounce on this view. The Opium Central Board and Supervisory Committee laid down the world's legitimate need of drugs (162 countries out of 177 sent information); this work was officially described by the U.S.A. as of the highest importance, notably in time of war.

The League budget—Russia's expulsion involved a serious loss—was pared to the bone, less than £1,000,000, which was over 34% less than that for 1939, and the equivalent of some four days of Switzerland's mobilization costs. (See also PACIFISM; REFUGEES.) (M. Fe.)

Leather. Stretchable leather, controlled by an elastic backing, which was introduced in 1938, has been further developed and is meeting with an increased demand. Among the newer developments are processes for making shoe lining and other leathers sanitary and antiseptic to prevent the growth of bacteria and thus promote cleanliness and elimination of offensive effects from foot perspiration.

Methods by which leather affected by poison gases may be decontaminated, have been devised in England. Nearly all types of leather may be freed from effects of mustard gas by immersion for six hours in water at 120° to 130°F. Alum tanned leather, however, will not stand this treatment.

In seeking factors that might cause failure of white shoe leathers, studies have been continued to include the effect of various constituents of shoe finishes, polishes and cleaners upon the tensile strength and stretch of the leather. Sulphonated oils, certain gums, and glycerine tend to maintain a higher moisture content in the leather and, consequently, increase its strength and stretch. Materials such as ethyl alcohol and carbon tetrachloride that tend to dry out the leather and remove fats, cause an especially serious lowering of the strength and stretch of the leather. Shellac cut with borax decreases both strength and stretch. Turpentine, ethyl acetate and petroleum naphtha increase tensile strength and decrease stretch.

A study of currying leather has shown that the gummy spew which sometimes forms on vegetable tanned leather is due to oxidation and gelation of the cod oil present. This formation is

Table 1—Estimated Number of Staple Hides and Skins Tanned
(ooo's omitted)

	1929	1935	1936	1937	1938	1939
WORLD						
Cattle hides	101,614	103,507	105,223	104,874	101,515	103,142
Calf and kipskins	74,650	70,452	75,012	74,166	72,995	74,545
Goat and kidskins	87,664	74,426	80,122	83,557	78,863	80,276
Sheep and lambskins . . .	96,211	91,371	90,729	90,913	88,067	90,887
UNITED STATES						
Cattle hides	19,146	21,032	22,628	22,875	19,410	21,397
Calf and kipskins	15,364	14,140	13,127	12,440	12,500	14,273
Goat and kidskins	55,686	48,250	47,450	46,600	32,783	40,890
Sheep and lambskins . . .	38,085	38,465	37,942	34,235	28,950	30,442
GERMANY						
Cattle hides	9,116	9,074	9,610	9,817	9,750	9,814
Calf and kipskins	10,317	12,762	12,436	13,006	12,187	11,116
Goat and kidskins	8,512	7,775	7,527	8,313	6,450	7,987
Sheep and lambskins . . .	10,004	9,168	10,608	10,411	9,865	9,955
UNITED KINGDOM						
Cattle hides	10,612	9,862	11,063	11,413	10,960	10,787
Calf and kipskins	7,310	6,451	6,918	7,617	7,800	8,144
Goat and kidskins	8,516	12,015	12,613	13,005	13,195	12,610
Sheep and lambskins . . .	9,115	9,003	7,967	8,012	8,610	8,855
FRANCE						
Cattle hides	9,007	6,996	6,150	7,248	7,500	7,880
Calf and kipskins	7,689	6,713	7,005	7,512	7,895	8,055
Goat and kidskins	11,992	6,889	7,165	7,341	8,210	9,177
Sheep and lambskins . . .	12,055	11,003	10,815	11,417	11,612	12,545

accelerated by the presence of catalytically active metals, a high content of oil, and exposure to light and heat. It is prevented by water solubles in the leather and by free fatty acids either in the currying oils and greases, or formed afterwards. Spewing also can be prevented by the addition of anti-oxygens to the cod oil.

In continuation of studies to develop physical tests for measuring the properties of leather, a comparison has been made of five machines of different design proposed for determining the resistance of sole leather to abrasion. Eighteen leathers were used and all machines showed a general tendency to rate them in a similar order. Choice of abrasive had a greater effect on the results than the construction of the machine, and a machine measuring abrasion only appears to give as good an indication of the wear of the leather as one that attempts to emulate action of the foot.

The measure of the stretching of calfskin leather through an adaptation of the Mullen tester, long used for determining the bursting strength of paper, has been proposed as an index of quality that might be particularly significant in predicting the behaviour of leather in lasting and other operations in the shoe factory. Splitting a leather lowers resistance to stretch far more than can be accounted for by the decrease in thickness. Grain cracks occur either because of low resistance to stretching or a low extensibility of the grain. An inelastic grain can result from overloading with tanning, dyeing, or finishing materials.

As a result of the continual search for raw materials by those countries facing a shortage of staple hides and skins, Japan is reported to have developed a simple method for tanning chicken skins. The area of each skin approximates 0.7 of a square foot. The leather is said to be suitable for handbags and women's shoes. The commercial feasibility of using these skins is doubtful, however, since they command in Japan for the preparation of several popular dishes as high a price as the meat. Whale hides are also being tanned. Their appeal lies in the large supply from a single hide. It is claimed that the hide of a small whale yields as much leather as ten cattlehides, whereas that of a large whale is equivalent to 100 cattlehides. Italy, like Germany and Japan, has also turned its attention to the tanning of fishskins, with the newly established industry located at Milan. Skins of the dentex, carp, grayling, ray and eel, and even of the imported dried codfish, are used.

A new process and product has been developed in Australia for making carpets of sheepskins. The skins are tanned and dyed with the wool on and cut when necessary to provide patterns in various colours. The skin side is provided with a special covering and bound so that no pad is required.

The finished product is said to resemble a deep pile Chinese carpet.

Among the novelties in leather are ash trays, humidors and serving trays made from chrome leather thoroughly impregnated with a wax and then pressed into shape and finished.

The leading export countries in 1938 according to dollar value at the average annual exchange rate for the year were: United Kingdom \$16,113,000; United States \$12,061,000; Germany \$10,510,000; and France \$9,951,000. (R. W. F.; J. G. Sc.)

Lebanon: see FRENCH COLONIAL EMPIRE.

Lederer, Emil (1882-1939), German economist, was born in Pilsen, Bohemia, on August 22. He received his doctorate in law at the University of Vienna and his doctorate in political science at the University of Munich. In 1912, after two years of co-editorship with Werner Sombart of a sociological journal he became a lecturer at the University of Heidelberg. His *White Collar Workers in the Modern Economy* (1912) was one of the first books to call attention to the peculiar economic problems of middle-class office workers. His chief work was *Principles of Economic Theory*, published in 1922. He remained as full professor of economics at Heidelberg until 1923, when he went to the University of Tokyo as visiting professor for two years. His advocacy of a modified Marxism gained him the enmity of the Nazis, who expelled him from Germany in 1933. He went to the United States, where he helped his friend, Dr. Alvin Johnson, organize the Graduate Faculty of the New School for Social Research at Yale university. Lederer became first dean of this "university in exile," and served for two years. In the United States he published *Japan in Transition*, written in collaboration with his wife. He died at New York city on May 29.

Leeward Islands: see WEST INDIES, BRITISH.

Legislation, Federal. From the customary output of abundant Congressional legislation, the following statutes have been selected for review because of their social significance.

Administrative Officers Act.—The Administrative Officers Act incorporated in the Court Reorganization Plan of 1937 substantially proposes to effect two broad beneficial objectives advocated by the Bench and Bar. Specifically they are: (1) to place the business management of Federal courts under the judicial rather than the executive branch of the Government; (2) to expedite the administration of justice by providing for a full time officer to compile statistics relative to Federal court dockets and make recommendations based thereon to the end that the courts may keep abreast of their business. Formerly, the fiscal management of the entire Federal judicial system lay within the jurisdiction of the Department of Justice. Requests for salary increases for clerks and other court employees, for added appropriations, for library and office equipment, and other financial details, had to be submitted to the Attorney General. The budget for the courts was prepared by the Administrative Assistant to the Attorney General, the budget officer of the Department of Justice, and included in the general budget for the Department of Justice. The entire judicial system as a result becomes an integrated whole, responsible only to itself and implemented with the means to achieve an effective administration. Under the Act, provision is made for expert reports on the condition of all Federal courts and the means given to the courts to eliminate conditions causing delay in the over-burdened courts. Operating through the judicial councils of each circuit, the needs of the courts will be demonstrated by the statistics and findings of the Director in a quarterly report which will be submitted for their scrutiny and for such action as they see fit to take thereon. An essential part of the new provision requires the senior circuit judge in each circuit to convene a judicial council composed of the circuit judges at least bi-annually. To this council is submitted the quarterly reports of the administrative officer predicated upon his examination of the dockets of the courts in their circuit together with information as to the needs of the various courts, as required in the Act. On the basis of this report, the council is empowered to make recommendations to the district court judges. In the past, no authority was vested in any body to make recommendations to the district court judges and because of this autonomy, in certain instances, unfavourable conditions had to be tolerated. Under the new act they must now heed the admonition of the circuit council.

Neutrality Act of 1939.—In an effort to preserve its neutrality in wars between foreign states and to avoid involvement therein, Congress by this new act, voluntarily imposes upon its nationals by domestic legislation certain restrictions by which, however, the United States waives none of its own rights or privileges, or those of any of its nationals, under international law, and expressly reserves all the rights and privileges to which it and its nationals are entitled under the law of nations. Whenever the President, or the Congress by concurrent resolution, finds that there exists a state of war between foreign states, and that it is necessary to promote the security or preserve the peace of the United States or to protect the lives of citizens of the United States, the President shall issue a proclamation naming the states involved; and he shall, from time to time, by proclamation, name other states as and when they may become involved in the war and revoke such proclamation on the cessation of hostilities. Upon the issuance of such proclamation by the President, no American vessel may carry any passengers, articles, or materials to any state named in such proclamation. Violation is punishable by fine of not more than \$50,000, imprisonment for not more than five years, or both. Such proclamation shall bar any export or trans-

port, or attempted export or transport of any articles or materials (except copyrighted articles or materials) until all right, title and interest therein shall have been transferred to some foreign Government. The Act authorizes the President to define combat areas which, as defined, may be made to apply to surface vessels or aircraft or both. Here, too, violation is subject to a fine of not more than \$50,000 or imprisonment for not more than five years, or both.

After such Presidential proclamation, it shall be unlawful for any person within the United States to purchase, sell, or exchange bonds, securities, or other obligations of the Government of any state named in such proclamation, or of any political subdivision of any such state, or of any person acting for or on behalf of the Government of any such state or political subdivision thereof, issued after the date of such proclamation, or to make any loan or extend any credit (other than necessary credits accruing in connection with the transmission of telegraph, cable, wireless and telephone services) to any such Government, political subdivision, or person. These provisions shall also apply to the sale by any person within the United States to any person in a state named in any such proclamation of any articles or materials listed in a proclamation referred to in or issued under the authority of the law. For the conviction of any violation, the offender will be fined not more than \$50,000 or imprisoned for not more than five years, or both.

Following such Presidential proclamation, solicitation or receipt of any contribution for or on behalf of the Government of any state named is unlawful. Medical aid, food and clothing may, however, be solicited. If, in the President's judgment, forbidding a vessel's departure will serve to maintain peace between the United States and foreign states, or to protect the commercial interests of the United States and its citizens, or to promote the security or neutrality of the United States, he may require the owner, master, or person in command thereof, before departing from a port or from the jurisdiction of the United States, to give a bond to the United States with sufficient sureties, in such amount as he shall deem proper, conditioned that the vessel will not deliver the men, or any fuel, supplies, dispatches, information, or any part of the cargo, to any warship, tender, or supply ship of a state named in a proclamation issued under the authority of section 1 (a). Should the President find that special restrictions placed on the use of the ports and territorial waters of the United States by the submarines or armed merchant vessels of a foreign state will serve to maintain peace between the United States and foreign states, or to protect the commercial interests of the United States and its citizens, or to promote the security of the United States, he may ban such vessels, limit their navigation or revoke such instructions when the conditions which have caused him to issue his proclamation have ceased to exist.

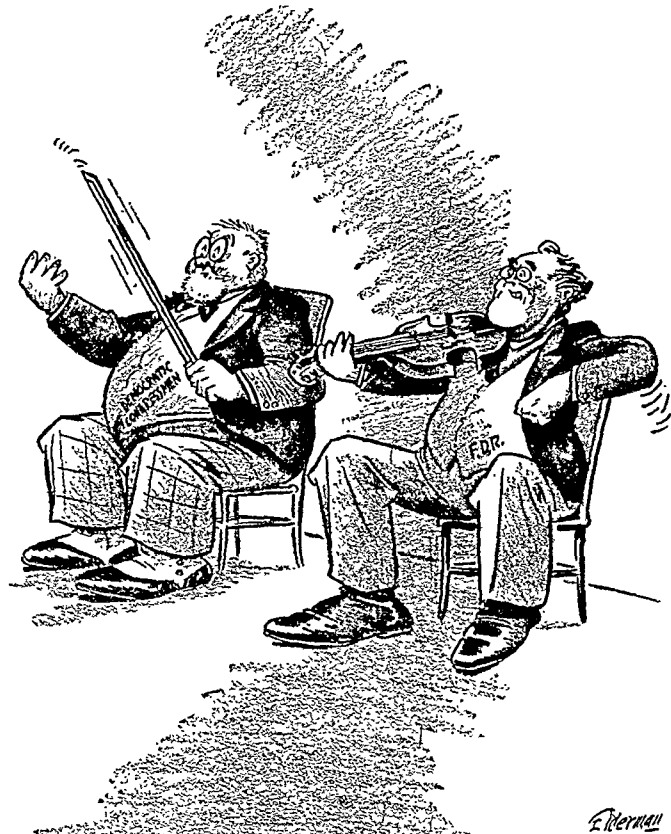
The National Munitions Control Board.—The Neutrality Act of 1939 repealed the arms embargo clauses of the joint resolution of Aug. 31, 1935, as amended. It continued, however, the National Munitions Control Board by re-enacting it with only minor changes. The Neutrality Act of 1939 provides that reports are to be made to Congress by the Board on January 3 and July 3 of each year in lieu of the annual report which had been in effect. The registration fee which formerly was \$500 with provisions for refund in case business aggregate was smaller than \$50,000 annually is now fixed at \$100. The period of registration is five years and the fee for renewal is \$100 for each subsequent five-year period.

Every person who engages in the business of manufacturing, exporting, or importing any arms, ammunition, or implements of war must register with the Secretary of State. It is unlawful for any person to export, or attempt to export from the United States, or

to import, or attempt to import into the United States any arms, ammunition, or implements of war without first having submitted to the Secretary of State (through the Office of the Board) the name of the purchaser and the terms of sale and having obtained a licence therefor.

The President is hereby authorized to proclaim upon recommendation of the Board from time to time a list of articles which shall be considered arms, ammunition and implements of war for the purposes, but the proclamation numbered 2237, of May 1, 1937 (50 Stat. 1834), defining the term "arms, ammunition and implements of war" shall, until it is revoked, have full force and effect as if issued under the authority of this subsection. In addition to its supervision over the articles proclaimed "arms, ammunition and implements of war" the National Munitions Control Board has been charged with regulation and protection of the U.S. resources of tinplate scrap and helium. (See also NEUTRALITY.)

The Revenue Act of 1939.—The new legislation was designed to remove hindrances to business and some inequities in the Federal tax system. It replaces the undistributed profits tax with a flat 18% income tax levy on corporations; permits carryover to 1940 and 1941 of operating losses; provides that the capital stock valuation may be increased; permits corporations in unsound financial condition to buy in bonds without paying income tax on the excess of face value over the price paid; and eliminates the limitations on deduction of corporate capital losses. It also extends the period for filing claims for refund of AAA taxes; prohibits sale of information obtained from tax returns; and requires tax collectors to file notice of lien for it to be valid. The enactment of the Internal Revenue Code, on Feb. 10, 1939, did not change the law as it existed on that date. Consequently, the law applicable to 1939 returns is the same as the Revenue Act of 1938, applicable to 1938 returns, except for the changes made by the Revenue Act of 1939 and the Public Salary Tax Act of 1939. The most important changes effected by the Revenue Act of 1939 were undoubtedly the amendments made to the Internal Revenue Code. Practically every taxpayer will be affected by one or more of the amendments, some of which will apply to returns for the calendar year 1939 and fiscal years beginning in 1939 and ending in 1940, others will apply only for taxable years beginning after Dec. 31, 1939. The assumption of a transferor's liabilities by a transferee in certain non-taxable exchanges is no longer treated as money received by the transferor at the time of the exchange. That is, the gain on the exchange is not, as heretofore, recognized up to the amount of the liabilities so assumed. Any advantage to the transferor, over the prior rule, at the time of the exchange, is offset, however, by a requirement that the basis of the stock or securities received in the exchange must be decreased by the amount of the indebtedness assumed by the transferee. The Act further provides generally that if compensation for personal service rendered over a period of five or more years is received only in the year such services are completed, the income tax attributable to the compensation shall not be more than the aggregate of taxes which would have been paid had the compensation been received in equal portions in each of the years involved. Taxpayers, if they so elect, may treat as income amounts received as loans from the Commodity Credit Corporation. Where the loans are so treated the Act provides for proper adjustments of basis for computation of gain or loss on a subsequent sale of the commodities. It allows corporations a credit against the 19% tentative tax for amounts used to pay, not only an original indebtedness as was the case prior to amendment, but also a renewed indebtedness. In either case, however, the original indebtedness must have been in existence on Dec. 31, 1937 and evidenced by a bond, note, etc., which also must have been in existence on that date. A new exception



"SPEAKING OF HARMONY," Elderman's wry commentary in *The Washington Post* on co-operation between Democratic congressmen and the New Deal in 1939

is added to the general rule that a discharge or satisfaction of indebtedness for less than face amount results in income to the debtor. The exception relates to situations where a corporation in an unsound financial condition discharges its indebtedness, evidenced by a "security" for less than the amount received when the "security" was issued. "Security" means any bond, debenture, note or certificate, or other evidence of indebtedness, in existence on June 1, 1939. The commissioner has authority to require that an amount excluded from income shall be applied in reduction to the basis of any property held by the taxpayer. The limitation on deductions by insurance companies other than life or mutual companies, previously in force has been removed. The amendment extends to all taxpayers the privilege of valuing their inventories by the so-called last in, first out method, which was previously allowed only to tanners and producers and processors of non-ferrous metals.

Social Security Act Amendments.—The Social Security Act enacted in 1935 which established a Federal old-age insurance program offering the States Federal co-operation and financial assistance in nine Federal-State programs (unemployment insurance, aid to the needy aged, aid to the needy blind, aid to dependent children, services for maternal and child health, child welfare, treatment of crippled children, public health and vocational rehabilitation) has been amended following an intensive study of some three years by the Social Security Board.

The original Social Security Act did not take into account monthly benefits for survivors of insured individuals. Benefits to survivors were limited to lump-sum death payments. The amendments set up a system, however, whereby monthly insurance benefits with respect to qualified individuals who die after Dec. 31, 1939, are paid to widows, dependent children, or dependent parents who meet the stated requirements.

Death benefits in a lump sum equal to 3½% of the total accumu-

lated wages credited subsequent to Dec. 31, 1936, to an individual who dies before Jan. 1, 1940, will be paid, as heretofore, to his relatives or to his estate. The new law provides that after Jan. 1, 1940, lump-sum death benefits shall be paid only when the insured individual leaves no survivor entitled to survivor's benefits and, in that event, in an amount equal to six times the monthly primary insurance benefit. The payment is made to surviving relatives named in the statute or, if no such relatives survive, then to any person or persons "to the extent and in proportion that he or they shall be paid the expenses of burial of the deceased." Claim must be made for lump-sum death benefits by those entitled thereto within two years after the death of the insured individual.

The new law imposes the duty upon the board to make deductions from payments under Title II up to the full amount of the individual's monthly benefit or benefits for any month after retirement in which he rendered services for wages totalling \$15 or more. In like manner, violation of the retirement provision by an individual with respect to whose wages a benefit or benefits are payable also renders a wife's or child's insurance benefit subject to deduction.

Similarly deductions must be made (1) if a child under 18 and over 16 years of age failed for any month to attend school regularly and the board finds that attendance was feasible, or (2) if for any month "a widow entitled to a widow's current insurance benefit did not have in her care a child of her deceased husband entitled to receive a child's insurance benefit."

The amendments required that the board must be satisfied with the following provisions of the State law: (1) there must be a provision which limits the expenditure of Federal funds for the administration of the State law to only such purposes and in only such amounts as the board deems necessary for proper and efficient administration: (2) in addition to the provision formerly required, for the immediate payment to the Secretary of the Treasury of all money received in the State's unemployment fund, there must be a provision for the deduction from this payment to

the Secretary of the Treasury of refunds paid by the State both on account of erroneous payments into the fund, and in accordance with the provisions of Section 1606(b) of the Federal Unemployment Tax Act; (3) the requirement in the State law that all money which the State withdraws from its unemployment fund must be expended in the payment of unemployment compensation, exclusive of administration expenses, has been modified by excluding from such necessary expenditure all refunds made of sums erroneously paid and all refunds paid to instrumentalities of the United States or its employees in accordance with Section 1606(b) of the Federal Unemployment Tax Act; (4) should the State lose any of the money granted for the administration, or spend more than the board finds necessary in the proper administration of the State law, provision must be made in the State law for replacement of such funds by the State within a reasonable time; and (5) after Jan. 1, 1940, the State law must provide for the establishment and maintenance of personnel standards (other than selection, tenure of office, and compensation) on a merit basis, which are reasonably calculated to insure "full payment of unemployment compensation when due."

The amendments also increase the amount of Federal money available to match State expenditures for aid to the needy aged, the needy blind and dependent children. More Federal money is also appropriated for grants to the States to aid them in strengthening and extending their public health, vocational rehabilitation, material, and child welfare programs.

The Federal old-age insurance tax, based upon the wages of every individual engaged in covered employment, is levied, collected, and paid in addition to all other taxes upon his income. An important amendment changes the rate of the tax, which is imposed alike upon employer and employee, by continuing the 1% rate through the calendar years 1940, 1941 and 1942 on wages received by the worker after Dec. 31, 1936, thus repealing the former 1½% rate for those years. The 2% tax rate for the calendar years 1943, 1944 and 1945, and the 2½% rate for the years 1946, 1947 and 1948 remain unchanged. As under the former law, a rate of 3% is imposed after Dec. 31, 1948.

The amending act, recognizing the uncertainty of continued employment, simply provides that adjustments shall be made "with respect to any payment of remuneration" in accordance with authorized regulations. Special refund to employees and receipts for employees having more than one employer during the particular calendar year are provided for. Each employer must pay both the employer's and employee's tax on wages up to \$3,000 paid to and received by the employee in a particular year, irrespective of the number of employers involved.

Although the tax base remains the same, i.e., the first \$3,000 of wages received by an employee from an employer, the amendments have specifically excluded certain payments from the definition of wages. The exclusions are: (1) payment to or on behalf of an employee under any employer plan or system providing for (a) retirement benefits, or (b) sickness or accident disability benefits, or (c) medical and hospitalization expenses in connection with sickness or accident disability, or (d) payments on account of death. These exclusions comprehend premium payments made by an employer for insurance or annuities, or payments into a fund to provide for any such insurance payments, or to establish such a fund; (2) payment by an employer (without deduction from the employee's wages) of an employee's old-age insurance tax; (3) employee's contributions under a State unemployment insurance law; and (4) dismissal payments by an employer which are not required by law.

A new duty has been imposed upon the employer to furnish each employee with a written form or statement showing the wages paid by him to the employee during specified periods. The statement



"WHOA—COME BACK! FOUL BALL!" Cartoonist Herblock's estimation of the work accomplished by the first session of the 76th U. S. Congress in 1939

must also show the names of the employer and employee, the period covered by the statement, and the amount of the tax imposed with respect to wages paid.

Credits extended to taxpayers against Federal unemployment compensation taxes have been liberalized. Certification for credit (up to the 90% limitation) for contributions actually paid under a State law are no longer limited to cases in which the State provisions comply with the Federal law with respect to covered services performed in employment. The amendments also take cognizance of those instances in which the taxpayer makes payment of contributions to the wrong State. Upon payment to the State entitled to contributions, the date of the erroneous payment is controlling for the purpose of allowing credit against the tax for the amount of contributions actually paid. The amendments have extended and clarified the conditions under which additional credit allowances shall be made.

Beginning with the tax returns to be filed for the taxable year 1939, the maximum extension of time for the filing of such returns under such rules and regulations as the Commissioner for Internal Revenue with the approval of the Secretary of the Treasury may prescribe, has been extended from 60 to 90 days.

Specific provision is made that the full amount of the Federal tax may be collected from a bankrupt estate which has not complied with the conditions prescribed by the law for obtaining 90% credit against the tax.

Under the new law extensive changes are effected in coverage of employment. The definition of employment applicable to services rendered on and after Jan. 1, 1940, continues unchanged; the exemptions accorded to casual labour and to services per-

formed for religious, charitable, scientific, and educational organizations (with a slight clerical change in the text). The domestic service exemption is extended to include employees performing such service in local college clubs or local chapters of college fraternities or sororities. A new definition of "agricultural labour" is included which considerably broadens the scope of the exemption for such service by excluding numerous types of activities considered to be intimately related to farming operations, but which have heretofore constituted covered employment. A new exception, similar to that already contained in the Federal Unemployment Tax Act, exempts family employment. The coverage of employees of certain non-profit organizations exempt from income tax is narrowed. Services of certain students, of student nurses and internes, and of newsboys under 18 are also specifically excepted.

Several large groups of employees, formerly excluded from coverage will, effective Jan. 1, 1940, be included under the Federal Insurance Contribution Act (the new amendment) and will be eligible for benefits under Title II of the Social Security Act. A great portion of the group performing maritime services, formerly excepted, will be covered. Also covered will be employees performing services for Federal instrumentalities which are not wholly owned by the United States nor exempt from employment taxes by virtue of any other provision of law. This will mean the inclusion of national banks, member banks of the Federal Reserve System, Federal Savings and Loan Associations, and other similar organizations and their employees. With respect to instrumentalities of States, all such instrumentalities were formerly excluded without distinction between those exercising functions of a governmental nature and those exercising functions of a proprietary nature. Under the amendments, the exemption accorded to instrumentalities of States is more restricted and such instrumentalities are now exempt only if they are wholly owned by the State or, irrespective of ownership, they are constitutionally immune from tax.

Trust Indenture Act.—Losses to investors during the early years of the last decade have focused the attention of the entire nation upon the United States' financial structure and methods of operation. To reconstruct a system which would more fully be enabled to withstand cyclical depressions, the New Deal called into existence the Securities and Exchange Commission in 1933. By the Securities Act of that year, The Securities and Exchange Act of 1934, the Public Utility Holding Company Act of 1935 and the Chandler Bankruptcy Act of 1938 the SEC has been vested with power to compel full and fair disclosure to investors of all material facts pertaining to securities publicly offered for sale to prevent fraud and unfair practices in the securities markets, and to regulate the financial practices of holding company systems controlling gas and electric utilities. In investigating the work, activities, personnel and functions of protective and reorganization committees as part of its report recommending a revised bankruptcy act, the commission sponsored the Trust Indenture Act in an effort to remedy the alleged defects in this branch of securities. The act requires extensive changes in trust indentures with respect to qualification and disqualification of trustees, duties of trustees before and after default, covenants of obligors, provisions with respect to taking down of additional bonds, release of property, satisfaction and discharge of the indenture, reports to indenture security holders and ordinary creditor relationships between trustees and indenture obligors.

On and after Feb. 3, 1940 it will be unlawful (Sec. 306) to use the facilities of interstate commerce or the mails: (a) to sell or

PLEAS FOR AND AGAINST repeal of the arms embargo poured into the U.S. Senate's mail room as Congress prepared to debate the Neutrality bill; on Sept. 19, 1939, congressional mail reached an all-time record of 490,000 letters in a single day



offer to sell a note, bond, debenture or evidence of indebtedness, whether or not secured, a certificate or interest or participation in such note, bond, debenture or evidence of indebtedness or a guarantee thereof unless (i) issued under an indenture, (ii) one of the trustees under the indenture is an institutional trustee meeting the requirements of the Act, and unless the indenture security is either (1) exempt from registration under the Securities Act of 1933 (sec. 304), (2) registered under the Securities Act of 1933, or (3) issued under an indenture which has been qualified as provided in the new Act.

Civil liability for damages caused by reliance on mis-statements or omissions is imposed unless the person sued shall prove he acted in good faith and had no knowledge of the alleged mis-statement or omission. The information with respect to the person designated to act as trustee must be contained in a separate part of the registration statement or application and must be signed by such person (Secs. 305 and 307). Its provisions are applicable to the issuance on or after Feb. 3, 1940 of securities under existing indentures, but the commission is on application authorized to grant exemptions. The terms of the new Act are not applicable to securities issued in private placements and assuming the persons purchasing securities in private placements can prove the limited number to whom the securities were offered, the bona fide intention of the purchasers to buy for investment and not with a view to distribution, and that the initial transaction was not a public offering, the securities originally issued in private placement may be subsequently sold without registration even though the indenture does not comply with the new Act. Although indenture securities of a public utility company subject to the provisions of Section 6 and 7 of the Public Utility Act of 1935 are issued in a private placement the commission requires that the indenture conform to the provisions of the Trust Indenture Act of 1939. The Act materially limits the financial institutions eligible to act as indenture trustees and may require a trustee to share with indenture security holders certain payments made on obligations owing to the trustee in its individual capacity within a period of four months before and after the default under the indenture.

The provisions defining conflicting interests of trustees and the provisions setting forth the eligibility and qualification of trustees are to be exclusive and the commission is not authorized to set up additional qualifications under the Public Utility Holding Company Act of 1935.

An indenture trustee is deemed to have a conflicting interest in the following cases: (1) If he is trustee under another indenture under which any other securities, or certificates of interest or participation in any other securities, of an obligor upon the indenture securities are outstanding unless (a) the indenture securities in question are collateral trust notes under which the only collateral consists of securities issued under such other indenture, or (b) such other indenture is a collateral trust indenture under which the only collateral consists of the indenture securities in question, or (c) such obligor has not substantial unmortgaged assets and is engaged primarily in the business of owning, or of owning and developing and/or operating real estate, and the indenture to be qualified and such other indenture are secured by wholly separate and distinct parcels of real estate.

The Act also considers the preferential collection of claims against an obligor, indentures of public utilities which must be qualified under the Public Utility Holding Company Act of 1935, duty to furnish bondholders list, reports, etc. It requires evidence of compliance with conditions precedent, prescribes the duties, responsibilities and special powers and claims of the trustee, notice of defaults, directions and waivers by bondholders. Procedurally, the commission is empowered to subpoena witnesses, and other departments of the Government are authorized to fur-

nish the commission such reports.

Miscellaneous.—Other significant measures have been enacted: to tax public salaries; to prevent pernicious political activities; amend National Stolen Property Act; aid in Federal reclamation; continue functions of Reconstruction Finance Corporation; postpone Federal Food, Drug and Cosmetics Act until Jan. 1, 1940; amend Civil Service Retirement Act; Merchant Marine Act of 1936, Agricultural Adjustment Act of 1938, Tennessee Valley Authority Act of 1933, Act authorizing the establishment of a Postal Savings Bank, and the Federal Seed Act. (See also PUBLIC UTILITIES.) (B. WE.)

Leland Stanford Junior University: see STANFORD UNIVERSITY.

Lemons and Limes. Exports of lemons from the United States in the 1938-39 season (Nov. 1, 1938, to Oct. 31, 1939) were the highest on record, 830,855 boxes, a 15% increase over the 719,891 boxes exported in the preceding season and more than double the five-year (1931-35) average of 359,689 boxes. Up to 1930-31 the United States was a net-importer of lemons. Expansion of citrus groves in the United States and the League of Nations' sanctions on Italian lemons in 1935 and 1936, relating to the invasion of Ethiopia by Italy, were foremost factors in the increased foreign trade in United States lemons. Exports of lemons from Italy for the nine months ending July 31, were 6,227,330 boxes in 1939 and 5,585,332 boxes in 1938. Italian boxes approximate 70lb. each; United States boxes, about 76 pounds. Principal exports of lemons by the United States in 1939 and 1938 were to the following countries:

	1939	1938
	boxes	boxes
Canada	433,145	348,574
United Kingdom	278,422	268,505
France	55,679	14,509
Netherlands	14,932	20,136
Philippines	6,317	6,967
New Zealand	4,500	7,517

Production of lemons in the United States was 10,650,000 boxes in 1939 and 11,097,000 boxes in 1938, the ten-year average (1928-37) being 7,881,000 boxes, all in California. Production of limes in the United States (Florida) was 95,000 boxes in 1939 and 95,000 boxes in 1938, against a ten-year (1928-37) average of 20,000 boxes. (S. O. R.)

Leprosy. The investigations in leprosy during the year 1939 followed the principles and general pattern of the methods formerly evolved. Surveys of its prevalence have been extended to uncharted areas and in those previously registered. Thus, the currently estimated number of cases within the French colonies, possessions and mandates is 150,000. Among 15,000 forest-dwelling natives of the delta of the Niger river 500 cases were found, a rate of over 3%, and as a result of this and other pertinent surveys the conclusion is reached that there are more than 500,000 leprosy persons in Nigeria. Reports from other parts of Africa point to an average incidence of approximately one-tenth per cent of the populations in widely separated districts. In Portugal, whose population is cited as 6,500,000 people, 3,000 cases are reported to be scattered throughout the country, and as many as 200 live at large in one village. The disease is regarded as endemic in areas of the northern part of Western Australia and in the Northern Territory, but the number of leprosy and rate of incidence is smaller than that which formerly prevailed. Among the indigenous of New Caledonia the incidence is stationary, while among the immigrants and the European inhabitants it is declining. On the other hand, an examination of 10,245 of the 40,000

natives of Malaita, British Solomon islands, revealed 138 leprous individuals, a rate of 13.4 per 1,000 population.

The remarkable variations in the type of leprosy occurring over large areas and in different races occupying the same area are likewise again brought to attention by a survey of the Rangoon Leper asylum in which 75% of the Burmese patients are suffering with the cutaneous form and but 39% of the Indians. This disparity exists also, but in less degree, in the clinics of Burma. Contrariwise, it has been noted that most natives affected in Basutoland develop a light degree of the neural type.

Search for the explanation of these differences of clinical forms and incidence has been carried on, particularly through epidemiologic studies. An evaluation of the role of hereditary factors has been attempted by comparisons and contrasts in the evolution of the disease within families and especially in seven sets of twins among the leprous patients of Surinam. Leprosy developed in two sets of twin partners of like sex; in one partner of each of two sets; in both partners of one set of unlike sex; and it has not developed in two sets of like sex though they were intimately exposed to leprous relatives. In the leprous pair of unlike sex the age at which the disease appeared and its subsequent development were highly concordant. The relation between exposure to infection and development of the disease was analyzed by application of the methods of life tables to data collected in the examination of 8,007 persons constituting 1,051 household families in the Philippine islands. With the adoption of a period of one month as a unit of exposure, and the computation of the attack rate per 1,000 person-years (1,000 persons observed for one year), it was decided that the annual risk of contracting leprosy is about five times as high (5.1 to 0.9) with as without household exposure. Further, the highest rate occurred in those between 10 and 14 years of age. The effects of meteorological fluctuations upon leprous processes were sought in the records of 2,779 new cases admitted at the Calcutta clinic during the two-year period of 1936-38, and it was concluded that the greatest clinical activity, and the largest bacterial content of the neuro-macular lesions (spots or wheals in which sensation is abnormal) appear to coincide with the hot and relatively dry season of March to May, and to decline abruptly with the onset of the rains. A similar quest was conducted in Madras Presidency through whose 400 clinics there were 200,000 admissions during the nine years 1931-39. In this instance the high rate of incidence is attributed to the hot humid climate of the lowlands, and it is remarked that the higher rates occur among the poor depressed classes, and in those under 12 years of age among school-children. The caste and marriage customs are considered also to contribute to the incidence. The dietary of people among whom leprosy was of high incidence was studied in a group of 83 persons comprising 14 families which resided in a suburb of Madras, and within each of which leprosy existed. It was learned that the chief food was milled parboiled rice; the total intake of food was insufficient in calories; and the calcium and vitamin B₁ content were below an amount considered adequate.

Contributions to the detection of the first dermatologic manifestations of leprosy, and to the knowledge of its period of incubation within the patient are in progress in the Philippine islands. Six hundred and twenty-nine children, born of leprous parents between Sept. 1934 and April 1938, have been repeatedly examined since birth, and 35 have thus far exhibited skin lesions which are pronounced as leprous. The first lesions in 14 of these children were papules or wheals which were similar to lesions of less significance, but in which the specific bacteria were demonstrated. All the children have been under observation for a year, but the great majority are less than three years old. Serological tests of established cases have been continued with

modifications of technique and reagents (antigens) made from chemical extracts of tubercle bacilli, and from the bacillus of Stefansky (rat-leprosy). Strong reactions were obtained in cutaneous leprosy; weak or negative reactions in neural leprosy; and indefinite reactions in those cases whose classification is indefinite. However, positive reactions occurred also in tests of some non-leprous individuals who had malaria, syphilis, or tuberculosis. One investigator claims to have made the differentiation between syphilis and leprosy by serological examinations of the blood of 24 leprous patients with the use of an extract of *Spirochaeta pallida* (the micro-organism causing syphilis). The lesions of syphilis may resemble those of leprosy and an individual may be the subject of both diseases simultaneously, hence confirmation of this test will be of great importance to diagnosis and treatment.

The analogies between rat-leprosy, a disease of rats, and leprosy of man continue to stimulate investigations of this disease. It has been discovered experimentally that the bacillus of rat-leprosy will gain entrance to the underlying tissues through hair follicles of the skin which have been emptied of hairs by artificial depilation, and are carried from these follicles to remote locations in the body by phagocytic cells of the blood. The processes of the disease in the rat are being studied also by chemical and physical (ultra-violet light) examinations of the tissue cells and the bacilli, which are separated from the cells by procedures of centrifugation and washing. Also, the cells of these leprous tissues have been transferred to the culture tube and are reported to have been grown under artificial conditions. Rat-leprosy is distributed among rats in many parts of the world, and other rodents will contract it under experimental conditions, but it has been discovered recently in the bandicoot (a large Indian rat) under natural conditions in India.

Summaries of the results of treatment afford additional evidence of the tendency of the neural form of leprosy to become arrested naturally as well as with treatment. In Basutoland apparently 60% of the light neural cases registered during the past ten years have become arrested spontaneously; and at Magokai, Fiji islands, there were 161 patients in whom the disease became quiescent or arrested for from six months to two years among 560 who were under treatment, and 70% of the former were neural cases. The onset, symptoms and course of this form of leprosy have led to the hypothesis that a vitamin deficiency may be a factor in its development, and in several localities treatments by hypodermic injections of vitamin B₁ have been instituted. It is reported that neuritic pains are promptly relieved by this therapy, and the general physical condition of the patient is improved. Another treatment of neuritic pain and persistent ulcers has been that of resection of a portion of the involved autonomic nervous system, and recently it has been proposed after several trials that the same purpose can be accomplished by the injection of novocaine around the large plexuses of this nervous system in the region of the kidney. (See also VITAMINS.)

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Lettuce. Production of lettuce in the United States in 1939 was reported by the Department of Agriculture as 24,066,000 crates compared to 19,676,000 crates in 1938 and a ten-year (1928-37) average of 19,433,000 crates. The acreage was 171,370 in 1939. In 1938 it was 150,220 acres. The ten-year average was 154,280 acres.

Prices ranged from 77¢ to \$1.68 in 1939. Average prices were \$1.40 a crate in 1939, and \$1.50 in 1938, with a ten-year average of \$1.51 per crate. Production in the United States, by seasonal varieties, was as follows in 1939, in 1938, and for the ten-year (1928-37) average:

	1939	1938	1928-37
Early	6,670,000 crates	4,776,000 crates	5,259,000 crates
Second early	7,481,000 "	5,804,000 "	5,382,000 "
Intermediate	801,000 "	809,000 "	939,000 "
Late (1)	4,210,000 "	3,689,000 "	3,576,000 "
Late (2)	4,994,000 "	4,598,000 "	4,277,000 "
			(S. O. R.)

Lewis, James Hamilton (1866?-1939), U.S. senator, was born at Danville, Virginia. The date of his birth is believed to be May 18, 1866, though he concealed his exact age. Both his parents died when he was an infant. As a child he was taken to Georgia, where he attended Houghton college. Later he studied at the University of Virginia and took courses in law at Savannah, Georgia. He went to the Pacific coast in 1886 and worked for a while as a stevedore on the Seattle waterfront. After being admitted to the bar in Seattle he entered politics and was elected representative at large in the U.S. Congress from Washington in 1896. He served as a colonel and inspector general in Cuba during the Spanish-American war, was later transferred to military duty in Puerto Rico, and from 1898 to 1900 was in the Philippines. Lewis moved to Chicago in 1903 and was city attorney and corporation counsel from 1905 to 1907. Elected U.S. senator from Illinois in 1912, he was appointed by President Wilson as representative of the Senate in London to prepare international laws for safety at sea. He was elected to the senate again in 1930 and re-elected in 1936. His colleagues honoured him by making him the first whip of the upper house and re-electing him unanimously to that position annually. His dress, tact and courtesy made him one of the most picturesque of American legislators. He died at Washington, D.C., on April 9.

Liberia, area c. 46,000 sq.mi.; pop. (est. Dec. 31, 1937) 2,500,000. Chief town (capital) Monrovia (pop. 9,700). President: Edwin Barclay; language, official, English; religion, Christian (Protestant).

History.—This independent African State enjoys a constitution modelled on that of the United States. There has been considerable improvement in the administration in recent years in consequence of which the United States has granted recognition to the Government, previously withheld. A program of expansion in the fields of health and education was continued during 1939 but the lack of modern communications—there are no railways—retards progress in the more remote districts. It is proposed to send students from Liberia college, the principal educational centre, to Achimota college in the Gold Coast. Rubber is exploited by an American company, Firestone Plantations. Liberia took an early opportunity of notifying the belligerent powers of her neu-

trality in the present war.

(J. L. K.)

Banking and Finance.—In 1937: revenue \$1,009,433; expenditure \$969,921; public debt (Dec. 31, 1937), external \$1,737,000; internal \$291,942. Currency: Liberian dollar, exchangeable at a fixed rate of \$4.80=£1 sterling.

Trade and Communication.—Overseas trade 1938: imports \$2,241,792; exports \$1,990,255. Communications 1938: roads suitable for motor traffic c. 150mi.; shipping cleared, 1,761,715 tons.

Agriculture and Mineral Production.—In 1938 (export figures) (in metric tons): rubber, latex 1,457; rubber, crepe 1,456; piassava 5,008; coffee 892; cocoa 549; palm kernels 462,682 bushels; gold 1,902 troy oz.; ivory 9,147lb; palm oil 162,757 imperial gallons.

Libraries. The use of libraries continued to increase without a corresponding increase of income. Although slightly larger expenditures were reported in many libraries, in general the situation in tax-supported libraries in the United States showed no great improvement as compared with 1938. Salaries of the majority of the professional staff are still distressingly low. It is estimated that 4% of the active librarians (12,124) are unemployed. Because of diminishing returns from invested funds libraries supported in whole or in part by income from endowments are facing a period of retrenchment and curtailment of services.

According to a report of the Library Extension Board more than 42,000,000 people in the United States, of whom 91.8% live in rural areas, were still without library service. The problem of library extension is primarily one for the appropriate agencies of the various States. The United States Office of Education has in preparation a study of the organization and functions of such agencies. State aid was initiated or continued in Arkansas, New Hampshire, Ohio, Pennsylvania and Vermont; in Canada, in British Columbia and Nova Scotia.

Michigan's \$500,000 fund was repealed and Illinois' \$415,000 program was vetoed. The Harrison-Thomas education bill, which includes provision for Federal aid for libraries, did not come up for action by Congress in the 1939 session; it is hoped that it will be introduced early in 1940.

Library Training and Personnel.—The 1938-39 report of the Board of Education for Librarianship (American Library Association) lists 31 schools of various types accredited by the board as meeting its standards; all are connected with teaching institutions. On March 1, 1939, the total enrolment was 1,750, including 211 for advanced study. The University of Wisconsin and Pratt Institute now require a bachelor's degree for admission to the library schools. The Hampton Institute Library school (for Negroes), organized in 1925, closed in June 1939. Temporary provision for the training of Negro librarians under the guidance of Miss Florence Curtis has been made by the Carnegie corporation.

In addition to scholarship funds provided by individual schools, the Carnegie corporation made a final appropriation of \$20,000 for the United States, and \$5,500 for Canada to be used over a three-year period for grants-in-aid for advanced study and research. The corporation also made endowment grants of \$50,000 each to the library schools of Pratt Institute and the University of Denver. The summer institute, as a means of assisting librarians in service to continue their professional preparation, met with a gratifying response from accredited schools. There has been further discussion of library "internships" as a method of training.

The Board on Salaries, Staff and Tenure (American Library Association) has in preparation classification plans for libraries in institutions of higher education (*i.e.*, university, college, junior

college and teacher training) similar to the *Classification and Pay Plans for Municipal Public Libraries* issued in 1938. Attention has also been given to the question of civil service in libraries.

Bibliography.—The second convention of the Inter-American Bibliographical and Library Association, held in Washington in Feb. 1939, and the conference on Inter-American relations in the field of publications and libraries, held in November, also in Washington, under the sponsorship of the State Department, are evidence of a desire to strengthen cultural relations with Latin-America. To provide for more effective co-operation, a grant of \$30,000 was made by the Rockefeller Foundation for the development of a Latin-American program by the American Library Association. Another event of importance was the appointment of Lewis Hanke as chief of the Hispanic division of the Library of Congress (July 1). The Rockefeller Foundation has also made a grant of \$60,000 to the American Library Association to be used over a three-year period for the purchase of American books of general interest, to be sent to selected popular libraries in northern and western European countries, to give European readers "freer access to the thought of American men of letters and of science." The Carnegie corporation, in addition to many other grants for library interests, appropriated \$198,000 for the development of teachers college libraries through purchase of books over a three-year period. The Association of College and Reference Libraries, organized in 1937 as the successor of the College and Reference section of the American Library Association, issued the first number (December) of its new journal, *College and Research Libraries*, under the editorship of A. F. Kuhlman.

Shortly after the outbreak of war in Europe a joint committee was formed to represent the American Library Association and other library organizations in the matter of the importation, particularly from Germany, of books and periodicals needed for research. Delay and irregularity in shipment, and the possibility of loss in transit, are inevitable under conditions of war. The Librarian of Congress agreed to act on behalf of American libraries in presenting to the State department statements sent to him through the committee.

Microphotography.—Interest and experimentation in the application of microphotography to library and research problems continue unabated. At present there is great need for simple, inexpensive reading machines, and several new models adapted for use with any microfilm have been introduced. New microphotographic laboratories were opened at Brown university and the Library of Congress. Possibility of destruction of books and manuscripts by aerial bombardment has quickened interest in microphotography in various European countries. Courses in microphotography for libraries were offered in the 1939 summer sessions of the Chicago and Columbia university library schools.

Eighteen libraries contain more than 1,000,000 volumes each, according to the latest available statistics: the Library of Congress, 5,591,710 volumes (June 30, 1938); the New York Public Library, 4,090,379 volumes (comprising reference department, 2,687,377 volumes and circulation department, 1,403,002 volumes) (Dec. 31, 1939); Harvard university, 4,079,718 volumes (July 1, 1939); Yale university, over 2,850,000 volumes (June 30, 1939); Cleveland (Ohio) Public Library, 2,161,390 volumes (Dec. 31, 1938); Chicago (Ill.) Public Library, 1,718,867 volumes (Dec. 31, 1938); Boston (Mass.) Public Library, 1,701,166 volumes (1939); Columbia university (New York city), 1,615,051 volumes (1939); Los Angeles (Calif.) Public Library, 1,601,447 volumes (June 30, 1939); University of California, approximately 1,314,000 volumes (comprising nearly 1,000,000 volumes at Berkeley and more than 314,000 volumes at Los Angeles) (1939); University of Chicago, 1,232,745 volumes (June 30, 1938); Cincinnati (Ohio) Public Library, 1,224,007 volumes (Dec. 31, 1938); Brooklyn (New

York) Public Library, 1,153,136 volumes (Dec. 31, 1938); University of Illinois, 1,130,584 volumes (July 1, 1938); University of Michigan, 1,025,815 volumes (June 30, 1938); Carnegie Library of Pittsburgh (Pa.), 1,017,856 volumes (Dec. 31, 1938); University of Minnesota, 1,017,690 volumes (June 30, 1938); Cornell university (Ithaca, N.Y.), 1,010,170 volumes (1939).

Such figures are very uncertain standards of comparison, because of differences in methods of counting and because public libraries with many branches contain many copies of new and standard books.

Library Buildings.—The Library of Congress Annex, occupied in 1939, adds 249mi. of shelving and 20ac. of floor space to the national library, over-crowded for many years. The administrative offices, cataloguing, book order and binding departments of the Brooklyn (N.Y.) Public Library have been moved to the new central building. Transfer of the public departments awaits further appropriations needed to provide for additional staff, and for the increased cost of maintenance. On April 1, the remodelled building (cost \$1,600,000) of the New York Historical Society (New York city) was opened after having been closed for two years. The cornerstone of the Franklin D. Roosevelt Library at Hyde Park, N.Y., was laid by the President on November 19. It is expected that the building (cost \$350,000) will be opened in the spring of 1941. Other buildings completed or dedicated during the year were: Babson Institute, Babson Park, Wellesley, Mass. (cost \$200,000); Bennett college, Greensboro, N.C. (Thomas F. Holgate Library; cost \$100,000; capacity 60,000 volumes); Drew university, Madison, N.J. (Rose Memorial Library); Fort Worth (Texas) Public Library (cost \$400,000; capacity 180,000 volumes); Littauer Center of Public Administration, Harvard university (contains library); Illinois State Archives building, Springfield (archives a division of State library; cost \$820,000); University of New Mexico, Albuquerque (cost \$341,416); College of New Rochelle, New Rochelle, N.Y. (Mother Irene Gill Memorial Library; cost \$400,000; capacity 108,000 volumes); Oregon State Library, Salem (cost \$850,000; capacity 525,000 volumes); Talladega college (Negro), Talladega, Ala. (Savery Library; cost \$150,000); Washington, D.C., Public Library, Petworth Branch.

Librarians.—Herbert Putnam, librarian of Congress for 40 years, retired August 1, becoming librarian emeritus. On June 21, at the Conference of the American Library Association held in San Francisco, he was chosen to receive the Joseph W. Lippincott award for the "most outstanding contribution to librarianship." The presentation was made in New York on October 18 at a luncheon in Dr. Putnam's honour.

On June 6 President Roosevelt nominated Archibald MacLeish to be librarian of Congress, and on June 29 the appointment was confirmed by the Senate. Mr. MacLeish, born in 1892, trained in the law, is best known as a poet and the winner of the 1932 Pulitzer Prize for Poetry. He assumed office October 1. At the time of his appointment he was curator of the Nieman Collection of Contemporary Journalism at Harvard university. Late in the year Robert W. G. Vail, librarian of the American Antiquarian Society at Worcester, Mass., since 1930, was appointed director of the New York State Library at Albany, in succession to James I. Wyer who retired in 1938. He begins his new duties Jan. 15, 1940. Carl M. White, librarian of the University of North Carolina, will succeed Phineas L. Windsor who retires Sept. 1, 1940, after 30 years as librarian of the University of Illinois and director of its library school. Julian P. Boyd, librarian of the Pennsylvania Historical Society, was appointed librarian of Princeton university.

Louis M. Nourse became librarian of the Kansas City (Mo.) Public Library on March 1, 1939.

Ernest Cushing Richardson, for many years librarian of Prince-

ton university, and since his retirement in 1925 honorary consultant in bibliography and research in the Library of Congress, died on June 3 at the age of 79. Scholar and bibliographer, Dr. Richardson will be long remembered for his efforts to promote national and international co-operation in the organization and development of the materials for scholarly research. George Watson Cole, librarian-emeritus of the Henry E. Huntington Library (San Marino, Calif.) died on October 10, aged 89. The catalogues of the library of E. D. Church (now in the Huntington Library) which he prepared will long stand as models of scientific description and bibliographical scholarship. Mary E. Robbins, first director of the school of library science at Simmons college, Boston, died in June at Lakeville, Connecticut. The deaths of two younger librarians should also be recorded: on August 4, Donald B. Gilchrist, librarian of the University of Rochester since 1919; on December 19, J. Howard Dice, librarian of the University of Pittsburgh since 1920.

BIBLIOGRAPHY.—For further information about American libraries consult: *Bulletin of the American Library Association* (Chicago); *Library Journal* (New York); *Library Quarterly* (Chicago); *American Library Directory, 1939*, comp. by Karl Brown (1939). Important contributions to library literature were: Wilhelm Münthe, *American Librarianship from a European Angle: An Attempt at an Evaluation of Policies and Activities* (1939); Clara W. Herbert, *Personnel Administration in Public Libraries* (1939); Edna Ruth Hanley, *College and University Library Buildings* (1939); James Westfall Thompson, *The Medieval Library* (1939); A. E. Bostwick, *A Life with Men and Books* (1939). (C. F. McC.)

Great Britain.—Up to Aug. 1939 there was steady development of the library service in Great Britain, much evidence being shown of an increased interest by the general public in reading, cultural and recreational. Slum clearance and the migration of the population from cities to one-time country districts has been followed by the establishment of still more attractively designed public libraries which have immediately become a social asset, appreciated by a large percentage of the people. Owing to the war, the arrangements for the opening of the new Huddersfield Central Library were altered, but the fine new central library in the Civic Centre at Southampton was completed earlier in the year and opened by the duke of Gloucester.

The war naturally had a considerable effect on libraries, and the upheaval experienced in the first months seemed to presage severe restrictions of the service everywhere. Fortunately this did not happen and although some public libraries had to curtail hours, or had rooms commandeered or lost staff owing to military and civil defence calls, greater use of them than ever before resulted. Deprived of many other forms of entertainment, a great number of people found in the library a new source of enjoyment and this is reflected throughout Great Britain in the rising issues of books.

The national and the university libraries also had their service interrupted owing to the transfer of valuable material to safe places and the evacuation of some of the universities. Consequently research work suffered toward the close of 1939, but it was indicated that gradually the normal service of these institutions was being resumed.

In France, the great libraries such as the Bibliothèque National and the Mazarine closed down on the outbreak of war, but within two months opened again with a restricted service.

In Australia the publication of the New South Wales Libraries Advisory Committee Report, with its far-reaching proposals, focused attention on the library service of that State and progress is bound to be made.

In New Zealand, an important development was the appointment of a library liaison officer, attached to the Government Country Library Service, to co-ordinate the services, arrange for professional instruction and to develop propaganda. This was made possible by a Carnegie Corporation of New York grant to the New Zealand Library Association.

(D. C. H. J.)

Libya: see ITALIAN COLONIAL EMPIRE.

Liechtenstein, an independent European State, situated north-east of Switzerland, to which it is united in a customs and postal alliance. Area 65 sq.mi.; pop. (est. Dec. 31, 1936) 12,000. Chief town, Vaduz (capital, pop. 1,710). Ruler: Prince Franz Josef II, b. 1906, *suc.* 1938; language: German; religion: Christian (Roman Catholic 90%); products: corn, wine, fruit, wood, and marble; revenue (1938) 2,190,800 Swiss francs; expenditure (1938) 1,880,900 Swiss francs; public debt (Jan. 1, 1938) 4,330,300 Swiss francs; currency: Swiss franc, approx. 17.8=£1 sterling (Dec. 30, 1939).

Lie Detector: see CRIME DETECTION.

Life Insurance: see INSURANCE, LIFE.

Life Span: see BIRTH STATISTICS; DEATH STATISTICS; INFANT MORTALITY; SUICIDE STATISTICS.

Lighthouse Service: see COAST GUARD, U.S.

Lighting: see ARCHITECTURE; ELECTRIC LIGHTING; MOTION PICTURES; for air raid precautions see COAL INDUSTRY.

Lightning War. The term "Lightning War" (Blitzkrieg) can be used to indicate any kind of quickly waged war. However, it has come to mean a definite technique in quickly waging war. It means a war waged quickly by taking the fullest advantage of the powers of aviation, mechanization, and motorization to make good the limitations of infantry, horsed cavalry, horse-drawn artillery, and transport and pack artillery and transport. This while using their powers to make good the limitations of aviation, mechanization and motorization. By doing this, quicker and more continuous blows against an enemy can be struck than was true when the older type of arms alone were used. At the same time harder blows and more effective ones can be dealt than if aviation, mechanization and motorization alone were used.

Experimentation by the German and Italian armies and air forces in Spain during the Spanish Civil War proved and disproved various theories held in these armies and air forces with respect to the technique of Lightning War. As the result of these experiences both countries made changes in their organization, armament, and tactics.

Albania was a dress rehearsal on a small scale for the Italians. The conquest of Poland in less than three weeks by the Germans was effective proof that the technique was correct.

Admitting that the weather favoured the Germans and that the Polish initial concentration was bad from a strategical point of view, the fact remains that it was not either of these factors but the German preparation to wage, and skill in waging, blitzkrieg which brought about the decisive defeat of the Polish Army and air force in such a short period of time.

The Polish Army and air force were not poor ones. From the point of view of organization, equipment, and armament of those countries as yet unprepared to either meet or wage this type of war, the Polish forces were both first class. However, the Polish air force was greatly inferior in strength to that of Germany.

The Polish infantry division, as is true of most divisions of infantry throughout the world today, did not have the considerable proportion of anti-tank and anti-aircraft weapons which make up the armament of the present German divisions. The Poles lacked the mechanized force essential to a cavalry corps. Without a mechanized force horsed cavalry cannot meet modern conditions. The Polish Army as a whole lacked the artillery of various types, the tanks, and the aviation necessary under modern conditions to either successfully resist or wage blitzkrieg.

In general, the method of waging blitzkrieg is as follows:

- (1) An attack from the air on all enemy aviation fields and centres.
- (2) At the same time, if the attacker has enough aviation, if not immediately after (1), an attack on everything necessary for the mobilization and concentration of the enemy's army, such as barracks, depots, supply centres, bridges, railway stations and junctions, railways and motor convoys.
- (3) If the border is fortified or already defended by troops in position, a standard assault is made consisting of a heavy bombardment of artillery of all calibres followed by a heavy aviation bombardment and then, as the infantry and tanks move to the assault, light bombers dive and bomb the enemy's position.
- (4) The way having been opened by this successful assault the pursuit of the enemy's beaten forces is taken up by the light divisions supported by aviation. The organization of these divisions varies in different countries, but in general includes motorcycle infantry and machine guns, armoured cars, horsed cavalry, and sometimes horse-artillery, light tanks carried in trucks, motorized infantry and artillery, anti-tank guns, engineers and signal troops.
- (5) Following come the armoured divisions of various organization in different countries. In general, each division consists of a reconnaissance echelon, a tank echelon, and a ground-holding echelon. The first is made up of motorcycle infantry, armoured car companies and a company of heavy infantry weapons. The second consists of approximately 400 tanks organized in two regiments. The third is made up of a motorcycle infantry battalion, a motorized infantry regiment, a motorized artillery regiment, anti-tank and anti-aircraft artillery, signal and engineer troops.
- (6) Back of all come the standard type of infantry divisions with their accompanying artillery of all types, ready to give and take the hardest kind of blows. Frequently, the leading divisions are motorized.

The light and armoured divisions are not expected to do heavy fighting. They are for the purpose of surprise, to turn flanks, to break through wherever the resistance is not heavy and to pursue beaten troops. In all this the aviation lends the closest support through reconnaissance by attacking troops on the road and by the closest tactical support in action.

Where well armed enemy infantry ready to fight and in a good position to do so is encountered, the light and armoured troops go around a flank and leave the heavy combat for the regular divisions following in rear. In this way the enemy after his initial defeat is never allowed the opportunity to reform and reorganize.

If the border can be crossed before the enemy has completed his concentration, or better yet, his mobilization, then the chance exists to disorganize him thoroughly before he has completed his preparation to fight. Even in the countries which have universal service coupled with all preparation in the shape of equipment, armament and reserve officers and non-commissioned officers for a mobilization of their army to its war strength, time is necessary before this mobilization can be completed.

After mobilization more time is necessary to transport the troops mobilized to their concentration points near the threatened border. If the invader is already mobilized and concentrated, this time element gives him the chance to initiate Lightning War and get it well under way. Thus blitzkrieg even if not a surprise as to the place where the border is crossed can be called a surprise in time.

There are two other elements which increase the chance for a fully prepared country like Germany or Italy to wage blitzkrieg successfully. The first is to have not only strategic railways but also strategic autostrades. Even though Germany's railways have not been maintained in the best condition, they have been built for strategic purposes; that is, to insure mobilization and concentration of the German Army on the frontiers of possible enemies. In addition to this, the Germans have constructed or have under construction to meet all strategic needs broad motor roads with every modern improvement to insure safe and quick passage of columns of motorized and mechanized troops. Some of these roads will permit four columns of mechanized or motorized troops to advance in the same direction at the same time. The other important preparation is the mobilization of all industry, either promptly when war comes or before the outbreak of war. This not only insures the army and air force being amply supplied with all equipment and armament when war comes, but also the maintenance and replacement of this equipment and armament, as the war progresses. Maintenance and re-

placement in modern war is a burden which only a large, efficient modern industry can meet. Such industrial mobilization also insures the possibility of re-equipping and rearming with new types developed during war. These two factors, strategic communications and industrial mobilization, are absolutely essential if blitzkrieg is to be successfully waged. The army of the United States, including both the regulars and National Guard, is not equipped and armed either to resist or wage blitzkrieg successfully. The strategic railways and autostrades necessary to quickly concentrate U.S. troops do not exist on large sections of the frontiers and seacoasts. The industry of the United States would need at least a year and perhaps longer before it could be mobilized for war purposes. The only sure means of preventing blitzkrieg is, for a sea power, the possession of a fleet so strong that no possible combination of enemy sea powers could defeat it, and for a land power, the fortification of its frontiers with a Maginot or Siegfried Line constantly garrisoned with sufficient troops to prevent surprise attack.

Modern industry gives the industrial nations today the same chance for dominance on land which they have had at sea since the industrial revolution gave them the opportunity to build modern navies, while denying it to the non-industrial nations. This because only nations with a first class modern industry can prepare for and successfully wage blitzkrieg. (See also AIR FORCES; ARMIES OF THE WORLD; EUROPEAN WAR; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR.)

BIBLIOGRAPHY.—*Illustrated London News*, Aug. 19, 1939; *Nation's Business*, March 1939; *Army Ordnance*, May-June 1939; *Foreign Affairs*, Jan. 1940; *U.S. Infantry Jour.*, Jan.-Feb. 1940; *U.S. Cavalry Jour.*, Jan.-Feb. 1940. (H. J. Re.)

Lime. The popular conception of lime is primarily as a building material, but this is not the case; of the 3,347,000 short tons produced in the United States in 1938, only 26% was used in the building industry, and even in pre-depression days, when building was much more extensive, the proportion was well under one-half. Agriculture used 11%, and of the remainder 38% went to chemical, 15% to metallurgical and 10% to refractory uses. Of the total sales, about one-third is as hydrated lime and two-thirds quicklime. In Canada production dropped from 674,100 short tons in 1929 to 320,700 tons in 1932, increasing to 473,300 tons in 1936 and 549,350 tons in 1937, followed by declines in 1938 and 1939. (G. A. Ro.)

Limes: see LEMONS AND LIMES.

Limestone: see STONE.

Lindemann, Ferdinand von (1852-1939), German mathematician, was born in Hanover on April 12, the son of a teacher. He studied at the universities of Goettingen, Erlangen, Munich, London and Paris. He taught first at Erlangen, Wuerzburg and Freiburg, then at Koenigsberg, where he was rector in 1892-93. He was rector of the University of Munich in 1904-05 and full professor of mathematics there from 1893 until his retirement. Lindemann, who first proved the mathematical impossibility of squaring a circle, received the Steiner prize of the Prussian academy in 1900. He died at Munich March 7.

Lindgren, Waldemar (1860-1939), U.S. geologist and authority on mineralogy, was born February 14 at Kalmar, Sweden, and was educated there and at the mining academy at Freiberg, Germany. After moving to the United States he became assistant geologist of the U.S. Geological Survey in 1884 and later (1911-12) he was chief geologist. From 1912 until his retirement in 1933 he was professor of economic

geology and head of the department of geology at Massachusetts Institute of Technology. In 1924 he was president of the Geological Society of America, and in 1937 the Geological Society of London awarded him the Wollaston medal, premier international award for research in mineralogy. He died November 3 at Brookline, Massachusetts.

Linebarger, Paul Myron Wentworth (1871 - 1939), U.S. jurist and author, was born in Warren, Ill., on June 15. After attending Naperville college and Lake Forest university, he studied law in Paris from 1889 to 1892. He was admitted to the bar in Chicago in 1893 but returned to Europe shortly thereafter to continue his studies at the University of Heidelberg. During the Spanish-American War he was a lieutenant in the First Illinois cavalry. From 1901 to 1907 he was U.S. Judge in the Philippines. He resigned from the bench to become legal adviser to Dr. Sun Yat Sen, a position he held until the death of the founder of the Chinese republic in 1925. Later, from 1930 to 1937, he was legal adviser to the Chinese Nationalist Gov't. As "Paul Myron" he was author of books in several languages, notably the authoritative biography, *Sun Yat Sen and the Chinese Republic* (1924). Other works were *This Side of France* (1918), *The World Gone Mad* (1922), and *The Ocean Men* (1934). Mr. Linebarger also was founder and editor of the *Chinese Nationalist*. He died February 20 at Washington, D.C.

Linen and Flax. The fear of international hostilities, which had a depressing effect on the linen and flax industry in 1938, was realized in 1939. The result, however, was that at the close of 1939, there was serious shortage of supplies and a strong price trend. The cutting off of Russia and Germany from Irish manufacturing consumers because of the outbreak of hostilities plus the difficulties of maintaining any reasonable flow of trade with Estonia, Latvia and Poland, the other chief sources of flax supply, made the filling of orders a problem.

The year started with a continuation of the 1938 conditions. Demand was very light and the only activity in the Irish linen industry was that of supplying tent duck to the Government. Fine weave linens were piling up in warehouses due to restricted Far East shipments and United States buyers were not active. By May 1939, however, the Chinese shipments not only resumed on their usual scale but increased radically; 122.7% above the nine year average (1930-38) and 386.3% higher than in May 1938. China took 13.6% of the May 1939 exports from Ireland. Following that period, the failure of the Anglo-Japanese talks again left shippers uncertain. An encouraging note in 1939 was the putting into effect on Jan. 1, 1939, of the reciprocal trade agreement between Great Britain and the United States. Under the agreement, generous reductions in tariffs were made ranging up to 20% difference, especially in the finer weaves. Handkerchiefs were given a 15% difference, the duty being reduced to 35% instead of 50% on hemmed handkerchiefs. Table damask in the finer weave was reduced from 45% to 25%. Linen towels not exceeding 120 threads per square inch were reduced to 50% from 55% and under 120 threads per square inch from 40% to 20%.

This was hailed as a hope of more business from the United States and the publicity of the Irish Linen Guild at the New York World's Fair was also taken as a helpful indication by the Belfast market. The market was ready for any demands with large stocks in warehouses and plentiful supply in the looms. The only cause for apprehension was the securing of yarns. The Russia-German pact did not add any new problem as Soviet Russia had been withholding exports since 1938 and, it was expected, would not permit

any exports during the 1939-40 season.

The declaration of war in September brought a period of confusion when London wholesalers asked for deferred deliveries until they knew whether it would be necessary to remove their businesses out of potential air-raid areas; American buyers hurried home and Denmark, number one European customer, ceased buying. War-time regulation of the industry through the Flax Control Board limited supplies of yarn to filling contracts for private business placed prior to September 1, or for Government contracts. Prices of yarns increased 50% above 1938.

By October, these conditions had righted themselves and while prices were high, the warehouse stocks accumulated during the early part of the year found a ready market. Buyers from both North and South America apparently decided that it would be advisable to secure supplies while they were available. Chinese trade opened up and Denmark resumed ordering in November. The Neutrality Law of the United States also had its effect. It was expected that the Board of Trade would encourage linen shipments to the United States and Canada to provide the dollar exchange needed for purchase of armaments. Whether this hope was expressed by linen merchants to encourage more generous releases of yarns by the British Government agencies or was based on actual business indications still remained a question by December. However, the market was in a much better situation at the end of 1939 with a larger turnover of business than the previous year and the strong position of low stocks and restricted supplies. Higher costs were the chief concern; wages for workers in the handkerchief and other manufacturing sections increased 7½% and the prices of yarns, as previously noted, 50%. This shortage of yarns and high prices aroused a fear that the demand might revert to cotton and rayon during 1940.

(I. L. BL.)

Linn, James Weber (1876-1939), U.S. educator and author, was born at Winnebago, Ill., on May 11 and was graduated from the University of Chicago in 1897. He worked for a brief period as a reporter on the old *Chicago Record*, then returned to the university for graduate study. He was appointed assistant professor of English and remained on the faculty until his death. For 16 years he was a columnist for various Chicago newspapers, and he was the author of three novels, *The Second Generation* (1902), *This Was Life* (1936), and *Winds over the Campus* (1936). He also wrote *The Chameleon* (1903), *James Keeley, Newspaperman* (1937) and a biography of Jane Addams, who was his mother's sister. In 1938 Linn was elected an Illinois State representative on the Democratic ticket. He died at Lakeside, Mich., on July 16.

Linton, Edwin (1855-1939), American scientist, was born at East Bethlehem, Pa., on March 14. Educated at Washington and Jefferson college and at Yale, he became an instructor of mathematics at the latter institution in 1879. From 1882 to 1920 he was professor of geology and biology at Washington and Jefferson college. Dr. Linton, who was one of the world's leading authorities on the study of worms and parasitology, died at Philadelphia on June 4.

Lipman, Jacob Goodale (1874-1939), U.S. agricultural scientist, was born in Friedrichstadt, Russia (now a part of Latvia) on November 18; he was educated there by private tutors and later studied at Moscow. His family moved to the United States in 1888, and after several years of farming he entered Rutgers university, where he graduated in 1898. After receiving his master's and doctor's degrees at Cornell university he returned to Rutgers and was dean of the college of agriculture there from 1915 until his death. In 1911 he was also

appointed director of the New Jersey agricultural experiment station. Lipman was a pre-eminent authority on the chemistry of agriculture. He conducted pioneer research in soil nutrients which made possible more efficient and productive cultivation of crops. He made many significant investigations into the soil chemistry of nitrogen, sulphur, phosphorus, and other chemicals. In 1934 he received the Chandler medal for chemical research. He died at New Brunswick, N.J., on April 19.

Liquors, Alcoholic. The United States is the country of greatest production and consumption of potable spirits. Whisky is the predominant beverage. In the fiscal year ending June 30, 1939, the apparent consumption of all whiskeys was 101,452,000 proof gallons. Of these there were 91,795,000 of domestic origin, and the balance largely Scotch and Canadian. Corresponding figures for gin, brandy and rum were 13,392,000 gallons; 2,229,000 gallons; and 1,775,000 gallons. By far, the majority of these spirits is produced in the United States.

The distillation of whisky (the word derives from the Celtic *usquebaugh*=water of life) originated in Ireland in the 12th century, appeared in Scotland in the 15th century and assumed importance in England during the reign of Elizabeth. The first excise tax on distilled spirits dates from that period. Most of the whisky of today is produced in the United States, next are Scotland, Canada and Ireland. Considerable quantities are turned out in Australia and a few other countries.

Gin or geneva had its origin in Holland. English gin which was at first a copy of the Dutch product is known to the trade generally as London dry gin. It dominates not only the British but also the general world market. However, the production of gin in the United States is far greater than in England.

Brandy, or more specifically "grape" brandy was recognized for a long time as almost an exclusive product of France. In particular, the product originating from the Charente district and which alone is entitled to the designation "cognac" has been considered as a standard for this type of beverage. Lately, however, a quite fine quality of grape brandy has been produced in the State of California in the United States.

Rum, the distillate from fermented juice of sugar cane or molasses, was at one time a distinctive product of the West Indies, especially Jamaica. In the 18th century, the American Colonies took up the distillation of rum, adopting a somewhat different method which resulted in the New England type of rum. Up to the beginning of the 19th century, it was the predominating alcoholic beverage in America.

Other potable spirits are other fruit brandies, especially apple brandy or "apple jack," and a great variety of liqueurs or cordials. Many of these spirits are made almost exclusively in certain localities and then mostly from locally grown products, such as vodka (in Russia and Poland), kirschwasser (cherry brandy), slivovitz (prune brandy), and such specialties as benedictine, chartreuse and many others.

Until a few years ago, the world supply of whisky and gin was predominantly in the hands of English exporters, with Canada furnishing some whisky and Holland some gin. France shipped most of the brandy.

(A. J. LI.)

Literacy: see ILLITERACY.

Literary Prizes. Following is a partial list of the awards made in 1939.

International.—NOBEL PRIZE FOR LITERATURE (c. \$40,000): Frans Eemil Sillanpää, Finnish novelist. (See also NOBEL PRIZES.) ALL-NATIONS PRIZE NOVEL COMPETITION (\$15,000): Robert D. Q. Henriques, *No Arms, No Armour*.

United States.—ALL-NATIONS PRIZE NOVEL COMPETITION, AMERICAN SECTION (\$1,000): John Selby, *Sam*. ATLANTIC NON-FICTION PRIZE (\$5,000): Agnes Keith, *The Land Below the Wind*. COMMONWEALTH CLUB OF CALIFORNIA AWARDS TO CALIFORNIA AUTHORS, Gold medals: George R. Stewart, *East of the Giants* and Herbert Ingram Priestley, *France Overseas*. Silver medals: Oscar Lewis, *Big Four*, Edward Alexander Powell, *Gone Are the Days* and Dana Lamb (joint author with June Cleveland), *Enchanted Vagabonds*. DUKE UNIVERSITY PRESS PRIZE (\$1,500): Clement Eaton, *Freedom of Thought in the Old South*. JULIA ELLSWORTH FORD FOUNDATION CHILDREN'S BOOK CONTEST (\$2,000): Elinore Blaisdell, *Falcon*, *Fly Back*. FRIENDS OF AMERICAN WRITERS' PRIZE TO A MIDWESTERN AUTHOR (\$1,000): Herbert Krause, *Wind Without Rain*. GUGGENHEIM FELLOWSHIPS (c. \$2,500 each): Oscar Fritiof Ander, Herschel Brickell, Oscar Brynes, William S. Clark, Robert Donaldson Darrell, John Dos Passos, Elmer Ellis, Kenneth Fearing, Wallace K. Ferguson, Ernest C. Mossner, Herbert J. Muller, Charles John Olson, Gaines Post, Fannie Elizabeth Ratchford, Harold A. Sinclair, Robert Penn Warren, Arthur M. Wilson, Edmund Wilson, Howard Wolf, Richard Wright, Carl Zigrosser. HARPER NOVEL PRIZE (\$7,500): Vardis Fisher, *Children of God*. HOUGHTON MIFFLIN LITERARY FELLOWSHIPS (\$1,000 in addition to royalties and advances): Mary King, Helen Todd. NATIONAL BOOK AWARDS FOR 1938 (American Booksellers Association): David Fairchild, *The World Was My Garden*; Margaret Halsey, *With Malice Toward Some*; Daphne du Maurier, *Rebecca*; Anne Morrow Lindbergh, *Listen! the Wind*. JOHN NEWBERY MEDAL (most distinguished children's book, American Library Association): Elizabeth Enright, *Thimble Summer*. NEW YORK HERALD TRIBUNE CHILDREN'S SPRING BOOK FESTIVAL CONTEST (\$250 each): Alice M. Coats, *The Story of Horace* and Phil Stong, *The Hired Man's Elephant*. O. HENRY MEMORIAL AWARDS (best short stories): first prize (\$300), William Faulkner, *Barn Burning*; second prize (\$200), James Still, *Bat Flight*; third prize (\$100), David Cornel De Jong, *Calves*. POETRY (magazine) PRIZES (\$100 each): Maxwell Bodenheim, John Malcolm Brinnin, Malcolm Cowley, E. E. Cummings, H. B. Mallalieu, Stephen Spender. PULITZER PRIZES (\$1,000 in each class): fiction, Marjorie Kinnan Rawlings, *The Yearling*; drama, Robert Sherwood, *Abe Lincoln in Illinois*; history, Frank Luther Mott, *A History of American Magazines*; biography, Carl Van Doren, *Benjamin Franklin*; poetry, John Gould Fletcher, *Collected Poems*. MARY ROBERTS RINEHART MYSTERY NOVEL PRIZE CONTEST (\$1,000): Clarissa Fairchild Cushman, *I Wanted to Murder*. JAMES TERRY WHITE MEDAL (American Library Association): Louis Round Wilson, *A Geography of Reading*. JOHN ANISFIELD AWARD (\$1,000): Charles S. Johnson, *The Negro College Graduate*. DODD, MEAD DETECTIVE STORY (\$10,000): Hugh Pentecost, *Cancelled in Red*. HOPWOOD PRIZES (University of Michigan): poetry, John Anthony Ciardi, *Homeward to America*; fiction, Iola Fuller, *The Loon Feather*. SOUTHERN AUTHORS' AWARD: Ben Lucian Berman, *Blow For a Landing*.

Great Britain.—BENSON MEDAL (Royal Society of Literature): Christopher Hassall, John Gawsworth. JAMES TAIT BLACK MEMORIAL PRIZES (about £250 in each class): biography, Sir Edmund K. Chambers, *Samuel Taylor Coleridge*; fiction, C. S. Forester, *Flying Colours* and *A Ship of the Line*. CARNEGIE MEDAL (best juvenile book, Library Association of Great Britain): Noel Streatfield, *The Circus Is Coming*. SIR ISRAEL GOLLANCZ MEMORIAL PRIZE OF THE BRITISH ACADEMY (£100): John M. Manly, *The Text of the Canterbury Tales*. HAWTHORNDEN PRIZE (£100): Christopher Hassall, *Penthesperon*. HEINEMANN PRIZE (£40): Camille Mayran, *Dame en Noir*. IRISHWOMEN WRITER'S CLUB NONFICTION PRIZE: Mary Colum, *From These Roots*. STOCK PRIZE: Robert Graves, *Count Belisarius*.

Canada.—GOVERNOR-GENERAL'S AWARD: Kenneth Leslie, *By Stubborn Stars*.

France.—L'ACADEMIE FRANÇAISE. Le grand prix de littérature (20,000 fr.): Jacques Boulenger; Le grand prix du roman (10,000 fr.): Antoine de Saint Exupéry; Grand prix Gobert (18,000 fr.): Jean Leflon; Prix Louis-Barthou (22,500 fr.): Jacques Chevalier. PRIX PETITIDIER (15,000 fr. Maison de Poesie): Georges-Louis Garnier. RALPH B. STRASSBURGER PRIZE (\$1,000): Jean Pierre Le Mee, *Jeunesse d'Amérique*. GONCOURT PRIZE NOVEL (5,000 fr.): Philippe Hériat, *Les Enfants Gâtés*. FEMINA PRIZE NOVEL (5,000 fr.): Paul Vialar, *Rose de la Mer*.

Other European Prizes.—An extensive list is published in the winter number of *Books Abroad* (University of Oklahoma). (See also CHILDREN'S BOOKS.)

BIBLIOGRAPHY.—For historical information, see: Bessie Graham, *Famous Literary Prizes and Their Winners* (1939); Charlotte E. Murray, *Famous Literary Prizes* (1934). (M. A. WR.)

Literature: see AMERICAN LITERATURE; CANADIAN LITERATURE; DUTCH LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; ITALIAN LITERATURE; LITERARY PRIZES; PUBLISHING; RADIO, INDUSTRIAL ASPECTS OF; SPANISH-AMERICAN LITERATURE.

Lithium Minerals. Salts of lithium have long been used for medical purposes, and the metal has recently been used to some extent in the compounding of bearing metals. The latest addition to the use of lithium is the application of concentrated solutions of the chloride as a dehumidifying agent in modern air conditioning plants. The United States production of lithium minerals in 1937, amblygonite and spodumene from South Dakota, increased to 1,357 short tons. Ore production decreased heavily in 1938, but total output was increased by about 10 times in value, due to the recovery of lithium phosphate from the potash operations at Searles Lake, California. South-West Africa produced 764 long tons of amblygonite in 1938, and exported 315.5 tons. (See also METALLURGY.) (G. A. Ro.)

Lithuania, area 20,460 sq.mi. (excluding Memel area); pop. (est. Dec. 31, 1938, excluding Memel area) 2,575,000. Chief town: Kaunas (capital 130,000). President: Antanas Smetona; language: Lithuanian; religion: Christian (mainly Roman Catholic).

History.—Anticipating the eventual destiny of Memel, Lithuania decided in January to develop another overseas port at the fishing village of Shventai. Memel was ceded on March 22 in face

of a German ultimatum extending to about four days; and on the next day the state of emergency, proclaimed in Kaunas in December, was extended to the whole country. To compensate for loss of revenue resulting from this cession, a surtax of 25% was imposed on May 25 on the taxes on land, profits, income, etc., and the taxes on beer and cigarettes were increased. A trade agreement concluded with Germany on May 20 provided that Lithuania should receive a free zone south of the existing harbour at Memel, to be built by Germany; and on June 7 the compensation to be paid by Germany for Lithuanian property in Memel was fixed at 600,000,000 litas (about £22,000,000). In November all Lithuanian inhabitants of Memel were ordered to leave within 10 days, taking only personal luggage and 8 marks apiece. By the terms of the Soviet-Lithuanian pact of October 10 Russia gained the right to maintain limited land and air forces on Lithuanian territory, and the city and district of Vilnius (Wilno) was ceded to Lithuania. On October 27, the day of the official entry into Vilnius, a virtually compulsory internal loan of 60,000,000 litas was floated for the reconstruction of the city; and on October 29 Colonel Merkys, former governor of Memelland, was appointed governor of Vilnius. On March 27 the Government of Father Mironas resigned, and a new Government was formed by Gen. Chernius, with M. Urbsys as foreign minister. This was succeeded on Nov. 22 by a Government under Col. Merkys, with M. Urbsys foreign minister. (E. A. ASH.)

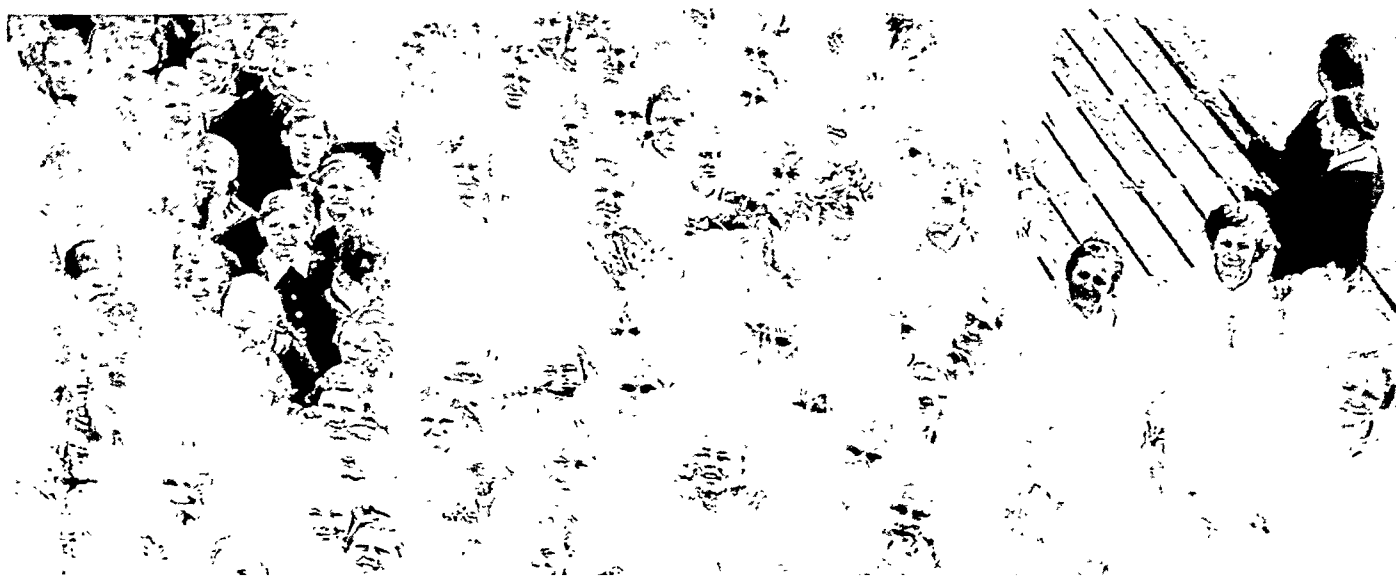
Education.—In 1937-38: elementary schools 2,601; scholars 307,173; secondary schools 273; scholars 31,647.

Banking and Finance.—Revenue (1938) 370,992,700 litas; expenditure (1938) 366,787,500 litas; budget estimate (1939) 367,900,000 litas; public debt (Dec. 31, 1938) 132,556,300 litas; notes in circulation (Aug. 15, 1939) 152,000,000 litas; gold reserve (Aug. 15, 1939) 62,000,000 litas; exchange rate (up to Sept. 1939) 27½-28½ litas=£1 sterling.

Trade and Communication.—Foreign trade (merchandise): imports (1938) 223,700,000 litas; (Jan.-Aug. 1939) 127,390,000 litas; exports (1938) 233,200,000 litas; (Jan.-Aug. 1939) 144,520,000 litas. Communications 1939: roads, suitable for motor traffic 20,948mi.; railways, open to traffic 1,173mi.; motor vehicles licensed (Aug. 31, 1938): cars 3,376; cycles 1,589; wireless receiving set licences (1938) 75,737; telephone subscribers (Dec. 31, 1938) 27,395.

Agriculture.—Production 1938 (in metric tons): rye 623,700, (1939) 653,400; oats 420,000, (1939) 401,700; barley 274,000, (1939) 246,700; wheat 251,300, (1939) 251,200; potatoes 2,118,300; flax and hemp (fibre) 25,800; butter 19,600. (W. H. WN.)

GERMAN SCHOOLGIRLS OF MEMEL organized their own celebration when Hitler seized the former Lithuanian port March 22, 1939



Little Entente. The Little Entente, a defensive alliance of Czechoslovakia, Rumania and Yugoslavia, against Hungarian aggression, found itself practically dissolved in 1939 by the extinction of one and perhaps the most active partner in the Entente. The dismemberment of Czechoslovakia in the fall of 1938 had not provided any opportunity for the *casus foederis*, as Hungary had refrained from any act of aggression and had received her share of Czechoslovak territory by negotiation. The Little Entente remained, however, in existence in 1939 as a defensive alliance between Rumania and Yugoslavia against Hungary and thus paralleled the defensive alliance of the two countries against Bulgaria as established by the Balkan Entente (*q.v.*). Hungary, while pressing her demands for the whole or part of Transylvania with renewed insistence against Rumania, expressed several times her readiness to arrive at an understanding with Yugoslavia and to drop all her claims against the latter country. In this endeavour Hungary found the active support of Italy. In case of success this Hungarian policy would mean the definite end of the Little Entente. (See also CZECHO-SLOVAKIA; HUNGARY; RUMANIA; YUGOSLAVIA.) (H. Ko.)

Livestock. Following the outbreak of war in Sept. 1939, belligerent governments adopted measures to encourage the production of meat animals and to further the imports of meat products. In the United Kingdom these various measures may be said to have culminated in absolute Government control when it was decreed that beginning with Jan. 15, 1940, all livestock (excepting hogs) marketed in the United Kingdom must be sold to the British Government. The Government set the prices and guaranteed a market consistent with farm costs. The Government also operated all slaughter houses and reduced the number from 16,000 to 750. Prices for cattle were announced as \$7.45 to \$11.58, according to grade; veal, \$11.74 to \$21.80; lambs and sheep, \$6.71 to \$28.50. In Canada a Government board took charge of ham and bacon production, under agreement with the British Government to take regular monthly quotas of pork products to Oct. 1940.

United States pork and lard producers in 1939 reported the largest pig crop on record and a huge export surplus. Exports of lard, however, were about 40% larger in the first 11 months of 1939 than in 1938, totalling 258,400,000lb. in 1939, while exports of pork for the first 11 months of 1939 were 112,200,000lb. or 24,600,000lb. more than in the same period of 1938. Germany negotiated pork product supplies with Hungary, Yugoslavia and Rumania, but apparently failed in negotiations with Bulgaria, which made arrangements to make shipments to Italy and Greece and also to Rumania. In the United States increased industrial activity maintained beef and mutton prices in the face of increased supplies. The trend in livestock in 1939 continued generally throughout the world to an increase in meat animals and a decrease in draft animals. Following are the numbers of livestock in various countries in 1939 and 1938 as reported by official sources and by the International Institute of Agriculture:

United States (as of Jan. 1)		1940	1939
Horses and colts		10,616,000	10,815,000
Mules and colts		4,321,000	4,384,000
Cattle and calves		68,769,000	66,789,000
Hogs and pigs		58,312,000	49,203,000
Sheep and lambs		54,473,000	53,783,000

Canada (as of June 1)		1939	1938
Horses and colts		2,824,340	2,820,700
Cattle and calves		8,474,600	8,511,200
Hogs		4,204,000	3,486,000
Sheep and lambs		3,365,800	3,415,000

United Kingdom (as of June)		1939	1938
Horses		1,075,700	1,093,500
Cattle		8,875,200	8,761,900
Hogs		4,309,100	4,383,100
Sheep		26,903,700	26,775,400

England and Wales		1939	1938
Horses		844,700	856,700
Cattle		6,762,200	6,714,300
Hogs		3,510,100	3,504,300
Sheep		17,976,100	17,912,500

Scotland			
Horses		142,300	144,800
Cattle		1,300,000	1,315,700
Hogs		252,900	257,400
Sheep		8,042,000	7,909,000

Northern Ireland			
Horses		88,700	92,000
Cattle		753,000	731,900
Hogs		627,100	561,500
Sheep		894,600	893,400

Germany (as of June 3)			
Hogs		22,482,000	20,806,304
Sheep		5,712,423	5,679,125

New Zealand (as of April 30)			
Horses		275,000	278,000
Cattle		4,505,000	4,506,000
Hogs		683,000	756,000
Sheep		31,858,000	32,379,000

Netherlands (as of May 15-17)			
Horses		322,152	311,576
Cattle		2,817,314	2,763,453
Hogs		1,553,418	1,537,783
Sheep		689,501	654,251

Switzerland			
Cattle		1,711,000	1,700,585
Hogs		880,000	922,897

Estonia			
Horses		218,500	219,000
Cattle		705,000	660,000
Hogs		442,000	384,600
Sheep		694,700	649,700
Goats		3,500	2,200

Belgium (as of Dec. 31)			
Horses		264,650	264,464
Cattle		1,689,680	1,710,337
Hogs		960,372	871,556

Bohemia-Moravia Protectorate			
Horses		273,621	268,102
Cattle		2,280,735	2,311,037
Hogs		1,607,191	1,949,034
Sheep		21,992	25,220
Goats		591,609	612,880

Denmark (Hogs, Nov. 18; Cattle, July 15)			
Cattle		3,258,000	3,186,000
Hogs		3,230,000	2,706,000

Latvia (as of June 26)			
Horses		414,470	400,470
Cattle		2,102,500	2,102,380
Hogs		891,470	813,500
Sheep		1,409,570	1,360,460

Lithuania (as of June 30)			
Horses		520,710	516,560
Cattle		1,103,550	1,097,340
Hogs		1,117,080	1,093,120
Sheep		1,223,600	1,208,420

Czechoslovakia (as of Jan. 1)			
Horses		468,695	462,371
Cattle		3,407,046	3,393,248
Hogs		2,082,733	2,523,988
Sheep		400,943	485,374
Goats		708,111	733,641

Hungary			
Horses		939,422	813,591
Cattle		2,379,532	1,882,031
Hogs		3,885,043	3,110,160
Sheep		1,868,122	1,628,730
Goats		65,972	41,445

France			
Horses		..	2,692,000
Mules		..	135,000
Asses		..	185,000
Cattle		..	15,622,000
Hogs		..	7,127,000
Sheep		..	9,872,000
Goats		..	1,416,000

U. S. S. R.			
Horses		..	17,500,000
Cattle		..	63,200,000
Hogs		..	30,600,000
Sheep and goats		..	102,500,000

Sweden			
Horses		..	617,000
Cattle		..	3,036,000
Hogs		..	1,371,000
Sheep		..	406,000

(See also CATTLE; DAIRYING; HOGS; HORSES; SHEEP.)

(S. O. R.)

Local Government: see MUNICIPAL GOVERNMENT.

Locusts: see ENTOMOLOGY: *Locusts* and *Grasshoppers*.

Logan, Marvel Mills (1874-1939), American senator, was born January 7 at Brownsville, Ky., where he practised law from 1896 to 1912. He was county attorney in 1902 and 1903, first assistant attorney general of Kentucky from 1912 to 1916, and attorney general from 1916

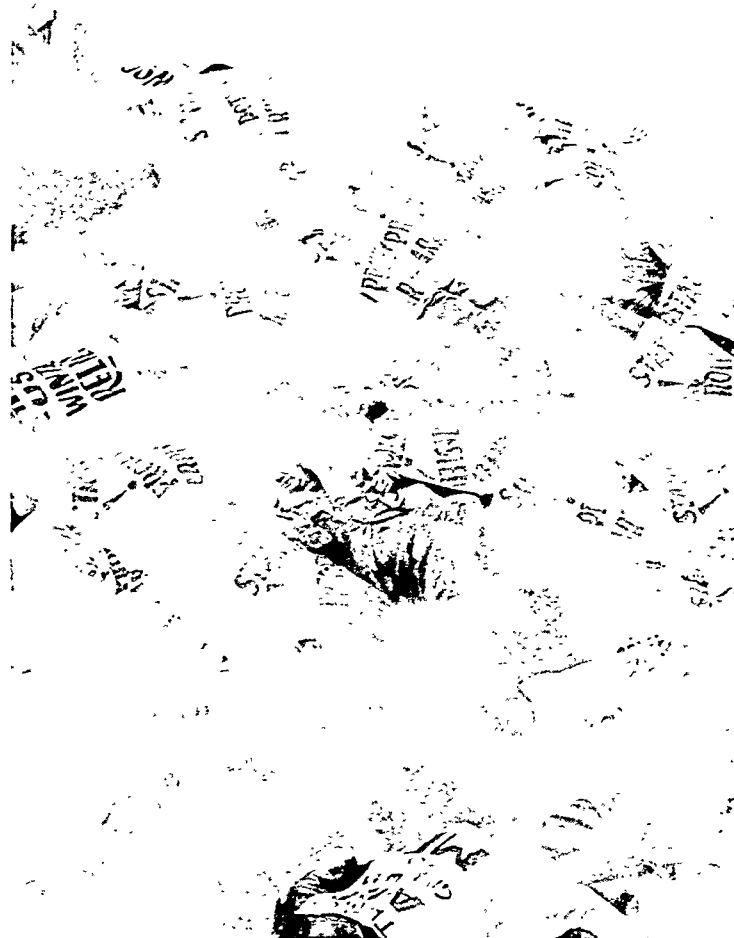
until he resigned on June 1, 1917 to accept appointment as chairman of the Kentucky State tax commission. The next year he resigned from this position to return to the private practice of law at Louisville. He became judge of the Kentucky Court of Appeals in 1926 and chief justice of that court in 1930, again resigning upon his election to the U.S. Senate for the term 1931-37. In 1936 he was re-elected for the term 1937-43. At the time of his death in Washington, D.C., on October 3 he was the ranking Democratic member of the Senate military committee and also served on the judiciary committee. In the Senate he supported much of the New Deal's legislation, including the Supreme Court bill.

London. Again there were no general elections in London's local Government during 1939, and before its close an act was passed postponing such for the duration of the war and allowing for casual vacancies to be filled by co-option. In the Jubilee year of the London County Council, an event celebrated with fitting ceremony in March, the chairman was for the first time a woman—Mrs. E. M. Lowe, J.P., a former chairman of the education committee, and E. C. H. Salmon, M.C., succeeded Sir George Gater as clerk.

The county rate remained unchanged at 7s 9½d; the rateable value increased by over £900,000 to £62,484,038; the net debt of the Council stood at £87,269,000 (over £52,000,000 being in respect of housing), and the value of its landed property at over £50,000,000. Its houses and flats numbered over 92,000 with a population of some 400,000; and, while the population of the administrative county has decreased to 4,062,800, an increase of 80,000 during 1937 brings that of Greater London in 1938 (the latest date for which statistics are available) to 8,655,000.

London's outward aspect continued to change rapidly even before wartime had made its vast contributions in sandbags, shelters, whitewashed kerbs and numerous defence works, not to mention the absence of street- and advertisement-lighting. The new Adelphi building, completed in 1938, was in 1939 housing the Ministry of Supply; in Mayfair the reconstruction of Saville row, where a new police station replacing the famous "Vine street" has been built, was finished, and much progress had been made with the extension and re-alignment of Curzon street, which now affords direct access between Berkeley square and Park lane. The bottle-neck in Kensington High street was removed; new Government offices were going up in Whitehall gardens, where the excavators uncovered most interesting remains of the old Whitehall palace; Wellington barracks and Regent's Park barracks were being rebuilt; and of the recommendation made in the Bressey report, progress was made with the Cromwell road extension, the duplication of Blackwall tunnel, the reconstruction of Wandsworth bridge and its southern approach (part of the South Circular road), and certain other outlying connections. All opposition to the development of the south bank of the Thames between Westminster and Waterloo bridges was withdrawn, and the Council had authority to proceed with it at an estimated cost of £1,629,000.

Helped by the Pilgrim Trust's grant of £50,000 towards the £400,000 necessary for the purpose, Parliament square was preserved as an open space, and the Westminster hospital that stood there for so long was replaced by a huge new building in Horseferry road, erected at a cost of £850,000 and opened by King George in April. In Old Palace Yard, Westminster, the erection of the revised design for the King George V memorial, prepared by Sir Wm. Reid Dick, R.A. and Sir Giles Gilbert Scott, R.A., had been assured. In Bloomsbury the destruction of the charm of the old squares continued, the growth of the new university being responsible for that in Russell and Torrington squares while the



LIE-DOWN STRIKE of unemployed men in Oxford street, London, Jan. 17, 1939. They demonstrated for an increase in winter relief funds

Tavistock square demolitions were occasioned by the extension of the British Medical Association's building. On the Strand-Fleet street line the internal reconstruction of "the king's chapel of the Savoy", which was to have been dedicated as the chapel of the Royal Victorian Order in the presence of the King and Queen and Queen Mary in October, was completed; both the Lyceum and the Gaiety theatres were closed and are to be removed; and Anderton's hotel in Fleet street, on whose site has stood an inn since the 14th century, made way for a huge office building. Much of the Lyceum theatre site, as well as that of Inveresk house in Aldwych, will probably be thrown into the extensive "roundabout" that it is proposed to construct as the northern outlet of Waterloo bridge, whose reopening is due in June 1940.

In the City, All Hallows church, Lombard street, built by Wren on the site of a Saxon church, had made room for a bank, and its tower is to be re-erected at Twickenham; new entrance gates were provided, and other improvements made, at the Tower; certain wharves were removed to allow of the extension of the Billingsgate fishmarket; and the final demolition of Doctor's Commons—well known to Dickensians—for the enlargement of telephone headquarters was assisted in early August by a disastrous explosion which caused much injury and damage.

London transport had an exceptionally busy year; the important extensions to East Finchley (N.E.) and Stanmore (N.W.) were completed, and good progress was made with that to Loughton (E.) and with others in the north and west; the refashioning of the High street Kensington, King's Cross and Piccadilly circus tube stations was finished and that of the King's Cross underground and the Euston terminus of the L.M.S. put in hand; while since Jan. 1 more newly electrified branches of the S.R. came into use. Passenger fares were increased in June. Before the outbreak of war much A.R.P. work had been done, but on its occurrence it became necessary temporarily to close 19 stations and the tunnels under the Thames for further protective work.

On the road an improved type of bus appeared during the year and another 37 miles of tramway were replaced by the trolleybus system. Large numbers of buses and nearly all the "Green Line" coaches were requisitioned for military or ambulance service, and by the close of the year all services were running to a restricted though adequate wartime schedule.

Any hope of the Thames being used as a passenger waterway was again frustrated, but before the war London bade fair to become a world air-centre. It was hoped that the city's £1,100,000 "super-standard" airport at Fairlop (Essex) would be ready before the end of 1941; and in addition to this the development of Heston (Middlesex) and Croydon (Surrey), and the negotiations for the new site at Lullingstone (Kent) were well advanced.

(L. H. D.)

London University. Up to the end of June 1939 the activities of the university were maintained to the full and the number of students in attendance was nearly 1,000 more than at the same time in 1938.

The international crisis in Sept. 1938, however, had led to serious consideration of the position of the university in the event of war and, at the instance of the Government, plans were prepared for transferring the work of the university to less vulnerable centres. These plans had been put into operation and most of the Colleges were being given hospitality in the provinces. Some departments have closed but most of the undergraduate work is continuing. The Imperial college, the London School of Economics (for some evening work), and Birkbeck college (for day and evening work) are in London. The total number of students has materially decreased but London, like other universities, is playing an important part by providing classes for as many students as possible between the ages of 18 and 20 and for students for whom it has been decided that the wise course is to continue training. The more important examinations of the university are being held although courses and examinations for many of the academic diplomas have been temporarily discontinued.

(S. J. W.)

Los Angeles, county seat of Los Angeles county, and largest American city west of Chicago, has an area of 442 sq.mi.; its present population is estimated at 1,600,000 (1,238,048 in 1930, 1,024,799 in 1900). During Sept. 1939, a record-breaking hot wave was ended by exceptionally heavy rainfall, followed by an unusually dry autumn. Under the reform administration of Mayor Fletcher D. Bowron complete reclassification of the entire civil service was effected, progress was made in applying scientific principles to the selection and management of personnel. Arthur C. Hohmann was appointed Police Chief and the entire department was reorganized. The councilmanic election resulted in the choice of a majority of members favourable to the new city administration. Tourist business in southern California for 1939-40 season was estimated at \$300,000,000.

During 1939 death removed Carl Laemmle, Sr., celebrated executive of the films; Addison Day, prominent civic leader; Zane Grey, distinguished author; and Douglas Fairbanks, famous in the films. Fatalities from automobile accidents for the county were again high despite all safety programs, though the ratio has been slightly reduced. A master Civic Centre plan for the location of important new structures was advanced. Los Angeles is second to New York in dollar volume of new construction. For the first 11 months of 1939 construction in the city amounted to \$69,416,994, a gain of nearly \$6,500,000 over 1938; while the total for southern California during the same period was \$192,503,976, a gain of \$18,415,784. In the Baldwin Hills area a large-scale rental housing project ("Thousand Gardens") is scheduled

for development. The National Association of Real Estate Boards held its largely attended 32nd annual convention in Los Angeles from Oct. 23 to Nov. 2, 1939.

Los Angeles harbour benefited from the lifting of the arms embargo; areas in the Pacific free for operation of American vessels include the Indian ocean, Malay area, Tasman sea, Arabian sea, Persian gulf and Chinese coast territory. The European war brought unprecedentedly heavy orders to aircraft manufacturers about Los Angeles, especially to Douglas, Lockheed and North American. Demand for petroleum and gasoline was very heavy.

Plans for developing its own municipal electric system by Los Angeles began to take shape in 1909; thirty years later (Aug. 1939) the city achieved this goal by purchasing remaining distribution properties of the Southern California Edison Company within its limits. June 30, 1939 the assets of the Bureau of Power and Light were \$226,649,987; gross revenue, \$27,051,567; earned surplus, \$647,788,849—the largest publicly owned electric utility in the United States. E. F. Scattergood is chief electrical engineer and general manager. The Colorado river project under the Metropolitan Water District neared completion. The main line, from the intake to Cajalco reservoir, 242mi., was completed and water was delivered by November 19. The distribution lines, which will serve 12 cities besides Los Angeles, are 70% constructed. The huge project was financed from the proceeds of a \$220,000,000 bond issue voted in 1931. Present indications are it will be completed at a cost \$20,000,000 less than original estimates.

(R. D. Hu.)

Lothian, Philip Henry Kerr, 11TH MARQUESS OF (1882–), British diplomat, was born April 18; he was educated at the Oratory school in Birmingham and at New college, Oxford. In 1908 and 1909 he edited *The State* of South Africa. Returning to England, he was editor of the scholarly *Round Table* from 1910 to 1916 and for five years thereafter he was secretary to Prime Minister Lloyd George. For a year (1921-22) he was director of United Newspapers, Ltd. In 1931 he entered the cabinet as Chancellor of the Duchy of Lancaster, and in 1931-32 he was parliamentary under-secretary in the India office, being also chairman of the Indian Franchise committee in 1932. On April 24, 1939, Lord Lothian, who had not previously held a diplomatic post, was appointed ambassador to the United States to succeed Sir Ronald Lindsay.

Louise, Princess, DUCHESS OF ARGYLL (1848-1939), sixth child and fourth daughter of Queen Victoria, was born at Buckingham palace March 18. She married the Marquess of Lorne, later the ninth duke of Argyll, in March 1871 and accompanied her husband to Canada when he became Governor General of the Dominion in 1878. The duke of Argyll died May 2, 1914. Princess Louise, who was the great-aunt of King George VI, devoted much of her life to sculpture and painting. She died at Kensington palace on December 3.

Louisiana, first State carved from the Louisiana Purchase, admitted to the Union in 1812, popularly known as the "Pelican State" or "Creole State"; area 48,506 sq.mi.; population according to U.S. census of 1930, 2,101,593; estimated Jan. 1, 1940, 2,210,000. Capital, Baton Rouge, 30,729. The only cities with larger populations are New Orleans: 458,762; Shreveport, 76,655. Of the State's population 833,532 are urban, or 39.7%; 1,318,160 whites; 776,326 coloured; 2,064,517 native born; 37,076 foreign born.

History.—The legislature did not meet, but there was intense preparation for the State Democratic primary election of Jan. 16, 1940. On June 26, 1939, Governor Richard W. Leche resigned and

was succeeded by Lieutenant-Governor Earl K. Long, brother of the late Huey P. Long; and shortly thereafter a series of public scandals were revealed, involving the president and certain business officers of the State university, several building contractors engaged in construction at that and other State-supported colleges, and numerous politicians high in the councils of the State administration. Several of the malefactors were sentenced to State or Federal prison terms, others stand indicted though not yet brought to trial, and the widespread investigations by State and Federal

authorities still continued as the year ended. The charges included diversion, misuse and embezzlement of public funds, forgery, use of the mails to defraud, and other violations of State and Federal laws. These scandals provided the chief issue in the Democratic primary campaign for nominations to State offices, nomination being tantamount to election. Twelve gubernatorial aspirants announced their candidacies, but subsequent withdrawals left only five in the race. Earl K. Long, governor, is (Jan. 1,



EARL K. LONG became governor of Louisiana June 26, 1939

1940) the administration candidate, the other aspirants being supported by various opposition factions.

Notable progressive movements of 1939 were: completion of the new \$14,000,000 Charity hospital in New Orleans, and smaller charity hospitals in other cities; continued expansion of the industrial program; construction of additional farm-to-market roads as part of the State highway system; pushing toward completion the combined highway and railway bridge over the Mississippi at Baton Rouge; extension of the rural electrification system; enlargement of the soil-conservation program; establishment of additional trade-schools; an extensive building program at the State-supported institutions of higher learning; opening up of new petroleum fields; and large expenditures on public improvements by the State and its municipalities.

Principal State officers: Richard W. Leche, governor (to June 26, 1939); Earl K. Long, lieutenant-governor (to June 26; governor after that date); E. A. Conway, secretary of State; A. P. Tugwell, treasurer; L. B. Baynard, auditor; G. L. Porterie, attorney-general (resigned early in year, and has had two successors since); T. H. Harris, superintendent of education.

Education.—Education is free and compulsory for all children. Separate schools are maintained for white and Negroes. Over 500,000 pupils are enrolled in elementary and high schools, 10% of whom are in private and parochial schools.

Charities and Correction.—The State maintains the following: charity hospitals at New Orleans, Shreveport, Lafayette, Pineville and Independence, under the new social security program; insane hospitals at Jackson and Pineville; schools for deaf and blind at Baton Rouge; training school for feeble-minded at Alexandria; Soldiers' home at New Orleans. There are also numerous private and endowed hospitals and orphanages. The State maintains three prison farms for adult offenders, and separate training institutes for male and female juvenile delinquents.

Banking and Finance.—There are about 120 State and 30 national banks, with total assets of \$500,000,000, deposits of \$450,-

000,000 and capital, surplus and reserves of \$50,000,000. The State's bonded debt is approximately \$150,000,000; assessed valuation of property \$1,500,000,000; annual State budget \$60,000,000.

Agriculture, Manufactures, Mineral Production.—Cotton, sugarcane, corn, rice, sweet and Irish potatoes, and hay are the chief staple crops, valued at nearly \$200,000,000 annually. Dairying, stock-raising, citrus fruit culture and truck and vegetable gardening are also important agricultural activities. Louisiana is a heavy producer of lumber. About 1,600 industrial establishments, with 70,000 employees, receiving \$50,000,000 annually in wages, produce commodities valued at \$500,000,000.

Principal manufactures are lumber and other wood products, oil and other cotton-seed derivatives, rice products, paper, refined sugar, petroleum products, carbon-black, chemicals, canned vegetables and sea-foods and tropical clothing. Petroleum, natural gas, salt and sulphur are the chief mineral products, with combined annual value of \$150,000,000. (W. Pr.)

Lumber production in the United States for 1939 is estimated at 25,500,000,000 board feet, or about 18% above that of 1938. The United States Census Bureau reported 21,646,000,000 for 1938. The estimated production for 1939 is somewhat above the midway point between the five-year average of 1925 to 1929, inclusive, and the low point of lumber production for several decades amounting to about 10,000,000,000 board feet in 1932. The leading species produced in order of importance are southern pine, Douglas fir, ponderosa pine, oak, white pine, hemlock, red gum, cypress and maple. Altogether about sixty species enter prominently into commercial lumber production. Southern pine is produced from 21 southeastern States, of which seven cut at least 500,000,000 board feet each. Douglas fir is cut in ten Pacific Coast and Rocky Mountain States, but two of these States, namely, Washington and Oregon, contributed about 95% of the total production of this species.

The outbreak of the European war early in September definitely affected both lumber production and the price structure. Generally prices advanced sharply during that month, and in some grades and sizes quotations advanced from 10% to 30%. Many mills, both in the South and on the West Coast, caught with low inventories were completely sold out, and refused further orders until Jan. 1, 1940. Lumber stocks in retail yards were generally low and this contributed materially to the advancing prices when the demand was felt at the mills.

Lumber exports were about 15% above 1938, although in the latter year they were the lowest for the past 40 years. Lumber exports advanced prominently during July and August 1939, but dropped off drastically during the following months. The signing of the Neutrality Act on November 4 definitely affected lumber shipments to Europe, which is the most important consuming market for export shipments from the United States. Railroad purchases of lumber, cross ties and structural timbers were a noteworthy feature during the summer months when railroad income began to show definite evidence of increase. Residential construction, which is the most important single item in lumber consumption in the U.S. was appreciably above the figure of 1938.

The two World's Fairs at New York city and San Francisco contributed to the increase of interest and use of lumber. About 27,000,000 board feet of lumber were used in covering more than 1,000,000 square feet of floor space at the Golden Gate Exposition. The use of timber connector construction played an important part at this Fair. More than 1,000,000 people visited the low cost five-room lumber exhibit house built by the National Lumber Manufacturers Association at the New York city fair.

In the foreign trade agreements which have been active for the past several years, the one with the United Kingdom and the sec-

and pact with Canada became effective Jan 1, 1939. Other negotiations are pending with Belgium, Argentina and Chile, as well as with some other important lumber importing countries.

Considerable attention has been given by lumber manufacturing concerns to a revision of American lumber standards, which have clarified definitions of grades and other matters important to architects, engineers, builders and others interested in lumber construction. One important basic improvement has been the inclusion of modern structural grading rules, which have been needed for many years. The Congressional Investigation Committee on Forestry held a number of hearings in the fall of 1939 to devise new legislation affecting forest policies on the part of the Federal Government. Hearings were held at Syracuse, New York; Mobile, Alabama; Portland, Oregon; San Francisco, California; and Madison, Wisconsin. Resulting legislation may have an important bearing on the lumber industry in the years to come.

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Other Countries.—The year 1939 will go down in lumber history as one of the most eventful periods ever known. Following a depression year from the lumber point of view, importers in leading European buying countries adopted a very cautious policy in the opening months of 1939. Softwood export quotas, fixed by the European Timber Exporters convention, were reduced from 3,164,000 standards in 1938 to 2,903,200 standards for 1939.

Purchases were very restricted until May, political uncertainties exercising a severe effect on the trade. Then the British Government introduced conscription and immediately a sharp impetus was given to the trade by the heavy demands for material for the building of hutment camps. In other European countries, too, demand quickened and prices went upward. The changed circumstances led the Exporters convention in August to increase the export quotas by 290,320 standards.

The European war revolutionized the trade. Under defence regulations, the British Government set up the Timber Control, and stringent regulations were imposed to ensure conservation of timber stocks in the country and to confine their use primarily to urgent work of national importance, such as defence work and air raid protection. All United Kingdom buying from overseas was concentrated in the hands of one buyer, the Timber Controller, and all stocks bought by him were to become national stocks. Toward the end of 1939 plans were being worked out for the rationing of these stocks and their allocation on a quota basis to importers and merchants for sale to consumers.

Germany's declaration of wood as contraband seriously hampered the export trade of the Scandinavian countries. Moreover, the over-running of Poland by Germany and the attack later on Finland by Russia put these two important timber exporting countries temporarily out of the picture. The result of the hostilities has been to change the directions of trade, and Britain has turned more and more to Canada and the United States for the satisfaction of her timber needs and to some of the smaller European countries that are not involved in the war. The loss of some important sources of supply has meant new and greater opportunities for other exporting countries that are rich in forest resources.

The value of timber exports into the United Kingdom in the eleven months, Jan. to Nov. 1939, was £34,708,162 compared with £39,413,401 in the corresponding period of 1938. (N. F.)

Lutherans. The Lutheran Church throughout the world, with a membership of nearly 70,000,000 faced the challenges of changing conditions with increasing gravity, during 1939. The situation, in Germany especially, made the serious considera-

tion of the old, unsolved problem of the relationship between the church and the State increasingly acute. The practical interests involved led to the restudy of fundamental principles, not for one country only but for the whole world. These changing conditions, challenging all of the claims of the Christian religion, influenced the executive committee of the Lutheran World Convention in the formulation of the program for its 1940 meeting in Philadelphia, Pa.

The year 1939 brought changed conditions which have required also a complete review of the work of the church in non-Christian lands, by all parts of the Lutheran Church engaged in foreign missions, placing upon Lutherans in America increased responsibility for missions heretofore maintained by European groups.

The movement for official union of the nearly 5,000,000 Lutherans in America according to reports on negotiations showed decided progress in 1939. A notable expression of the growing unity among Lutherans in America was given in a joint declaration, signed April 1939 by presidents of seven independent Lutheran bodies as the first such joint declaration on record. The title of that declaration was: "These Momentous Times," and it set forth "certain fundamental and controlling elements in the world's life," to be observed by Christians in times of confusion and chaos.

The possibility of war in Europe, as manifest at the time of the meeting of the Executive Committee of the Lutheran World Convention in Germany, May 1939, led that body of representatives of the Lutheran Church in all parts of the world to adopt a resolution that no matter what political or social issues or conditions might arise between nations, the bonds of Christian fellowship in the church should not be broken, but that the church would preserve its unity and continue its testimony against the evil of war, with continuous readiness to do its utmost for peace, while giving a full service of mercy to the suffering of all races and nationalities. (W. H. G.)

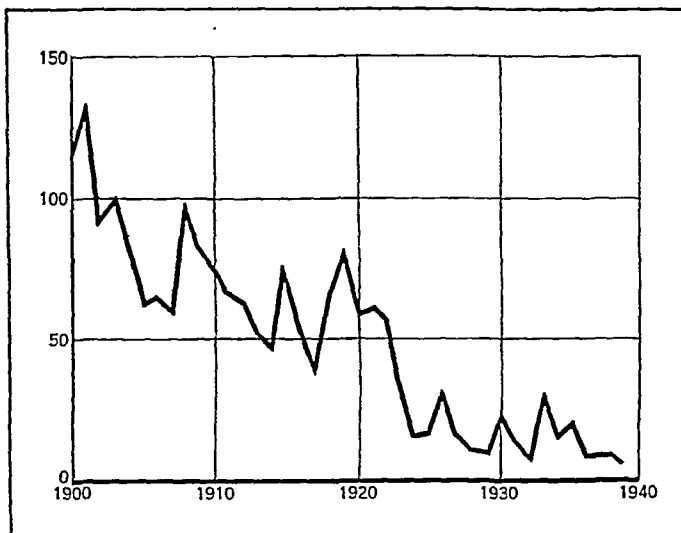
Luxemburg, an independent European State, south-east of Belgium, with which country an economic union was formed in 1922 and the customs frontier abolished. Area 999 sq.mi.; pop. (est. Dec. 31, 1937) 300,732. Chief town: Luxemburg (cap., 59,760). Ruler: Grand-Duchess Charlotte; language: Luxemburgian (idiomatic); official languages French and German; religion: Christian (mainly Roman Catholic).

History.—In April, the Grand Duchy celebrated the centenary of her independence, dating from the Treaty of London, April 19, 1839. On Aug. 3, 1939, the import quotas of a number of manufactured goods were suspended. Just before the outbreak of war in Europe, Luxemburg received assurances of respect of her neutrality from Germany (August 26) and France (August 29); but, though these assurances were observed during the remainder of the year, German preparations along the frontier were the object of an anxious watchfulness.

Finance.—Revenue (1938) 343,341,049 francs; (1939) 355,229,716 francs; expenditure (1938) 355,137,434 francs; (1939) 353,439,719 francs; floating debt (Nov. 15, 1938) 137,831,507 francs; consolidated debt (Nov. 15, 1938) 624,793,615 francs.

Lynchings. Five lynchings occurred, so far as could be learned, during 1939. Three of the victims were Negroes and two were white. Two of the lynchings occurred in Florida and one each in Louisiana, Arkansas and Mississippi.

Investigation, however, of the lynching of Joe Rodgers of Canton, Mississippi on May 8 disclosed a new technique in lynching which mobs in some States have adopted. Revelation of the sadistic details of lynchings during the debate on Federal anti-lynching legislation in the House of Representatives and the United States Senate had aroused public opinion, particularly in the South.



LYNCHINGS in the United States: number each year since 1900

Governors, chambers of commerce, and others who were working to induce textile and other mills to move their plants to the South found that lynching and mob violence was threatening the stability of labour supply as well as property and economically hurting States where lynchings occurred.

In the Joe Rodgers lynching, news of which appeared in no newspapers, the new technique was revealed of 30 or 40 mob members whose duty it was to take their victim to a secluded spot and there dispose of him. In one area of Mississippi it is alleged that at least four such lynchings occurred within a period of four months prior to the lynching of Rodgers who was put to death in the same fashion because he is said to have refused to pay rent for a company house belonging to the company for which he worked. It is alleged Rodgers refused because he had a home of his own.

Additional unpopularity of lynching was created by the jibes of Nazi and other newspapers when Americans criticized Nazi-Germany's mistreatment of Jewish, Catholic and other minorities. *Das Schwarze Korps*, organ of the Nazi storm-troopers, featured a photograph of President Franklin D. Roosevelt upon the occasion of his denunciation of the mistreatment of Jews in Germany when he declared that "It is difficult to believe that such things can happen in the 20th century."

Surrounding the President's photograph in *Das Schwarze Korps* were pictures of the lynching and burning at the stake of Negroes in the United States.

Efforts to secure enactment of the Wagner-Van Nuys-Capper-Gavagan-Fish Federal anti-lynching bill were continued during 1939. But neither house of Congress passed the bill. Refusal of the chairman of the House Judiciary Committee, Hatton W. Sumners, of Texas, to permit that committee to report the bill out of the committee to the floor of the House for debate and vote caused action to bring the bill to the floor by means of a discharge petition which was successful when the necessary 218 members of the House signed the petition which brought the bill out on Jan. 8, 1940. (See also NEGROES, AMERICAN.) (W. WH.)

Lyons, Joseph Aloysius (1879-1939), prime minister of Australia from 1932 until his death, was born of a poor Irish immigrant family in Stanley, Tasmania, on September 15. His education was largely informal. After a period as a school teacher he was elected to the Tasmanian House of Assembly in 1909. He was premier of Tasmania from 1923 to 1928. He became Australian postmaster-general and minister of public works in 1929. Lyons broke with his fellow

ministers in Prime Minister Scullin's labour cabinet in 1931 and founded the United Australia party, a strong opposition group which swept Scullin from office. Lyons became prime minister in 1932. Probably the most noteworthy accomplishment of his three successive terms was his reorganization of Australian finances. Lyons visited the United States in 1935 and represented Australia at the coronation of King George VI in 1937. He died after a brief illness at Sydney on April 7.

McDonald Observatory: see ASTRONOMY.

Machado y Morales, Gerardo (1871-1939), Cuban politician, was born on September 29, in the province of Santa Clara, Cuba. He joined the island's separatist movement when he was a youth of 22 and was twice decorated for bravery in the outbreaks that preceded the declaration of independence from Spain. After several years in private life he became inspector general of the Cuban Army, and secretary of the interior in 1908. As leader of the Liberal party he was elected president in 1925 for a four-year term. By adroit manipulation of the congress and the constitution, he first secured extension of the presidential term to six years, then effected his own re-election in 1928. Economic distress and growing unrest of the army led to his overthrow in Aug. 1933. His enemies accused him of wholesale political assassinations, and a trail of indictments followed him into exile in the United States and Europe. He was arrested in New York city at the request of the Cuban Government in Nov. 1937, but the charges against him were dropped the next month. He died at Miami Beach, Fla., on March 29.

Machinery and Machine Tools. Semi-automatic and automatic metal-working machines, for many years selected only for work in mass production plants because of the time necessary to set up cutting tools and cams or other control elements, during 1939 found increasing application on short-run jobs. This trend toward simplified tooling and more easily adaptable machine tools has been gathering momentum during the past few years. It now is economical to assign jobs of less than 100 pieces to types of machines that only a few years ago would have been used only when requirements were numbered in thousands. Production managers whose plants are equipped only with standard general-purpose metal-working equipment are finding it more and more difficult to compete with plants that are taking advantage of the profit-making possibilities offered by up-to-the-minute machines.

Attention in machine design to refinements that make metal-working equipment easy to operate and accurately controllable was even more noticeable during 1939 than in 1938. Controls frequently are interconnected and interlocked to safeguard the machine, the work, and the operator—on many current machines the operator has only to press convenient pushbuttons to initiate a machining cycle once the work-piece has been loaded and clamped. Seeking to fill the long-existent gap between the plain precision bench lathe (long used for small work of accurate nature) and the precision toolroom engine lathe, a number of lathe manufacturers in 1939 placed on the market floor-type lathes of 9 to 11-in. diameter swing. Each features desk-high working position, with all controls within easy reach of the operator whether he be standing or seated. Such arrangements result in faster production, more accurate work and reduced operator fatigue.

Perhaps the most consistent trend in the design of machine tools was the increasing use of hydraulic operating units. Solenoid-operated valves, by means of which the electric drive and control system can be interlocked with the hydraulic system to provide



THE PATTERNS OF INTERNAL STRESS remain permanently in flywheels and other machine parts and can be photographed in colour by virtue of a new process in photoelasticity developed by Dr. M. Hetenyi in Pittsburgh

"fool-proof" operation and permit automatic control, had much to do with the continuation of this trend. Limit switches operated by moving machine elements frequently actuate these valves. In some machines, particularly grinders, even the lubricating circuit is interlocked with the electric drive so that the main drive motor cannot be started until oil pressure in the bearings is sufficient to provide adequate lubrication. Excessive pressure in this circuit, indicating clogged supply pipes, or a drop in pressure will actuate interlocks and stop the machine.

Grinding, honing, lapping and "superfinishing" methods continued throughout 1939 to hold the interest of metal workers. One of the principal developments in this group has been fostered primarily by manufacturers of aircraft engines, and is gradually finding acceptance with other manufacturers. This is the grinding of threads, frequently direct from the solid in a roughing and a finishing pass. The year 1939, in fact, saw the development of one of the first commercially successful machines for grinding internal threads to precision limits. The wheel spindle of this machine operates at up to 18,000 r.p.m. and is adjustable for helix angle. Wheel dressing is automatic. Lead accuracy is assured by using interchangeable master leadscrew and nut assemblies.

Another first for 1939, also in the grinding field, is a machine for finishing curved-tooth bevel and hypoid gears. Generated tooth profiles are ground in this machine by means of a relative rolling motion between the wheel and the work. This motion consists of rotation of the cradle on which the wheel is mounted and the rotation of the work on its axis. The relative motion is the same as though the gear being ground were rolling with a generating gear. Operation is automatic, once the work is chucked and the wheel dressed. More and more applications are being found for the "superfinishing" method of producing an extremely fine surface finish, which uses a combination of short motions, light abrasive pressures, slow cutting speeds, hard abrasive stones and

a carefully selected lubricant. Specially designed machines and special honing stones were required for each application when this method was introduced during 1938; the year 1939 saw the development of both a general purpose superfinishing machine and standard heads that can be used for developing superfinished surfaces in engine lathes. The general-purpose machine can be equipped for between-centre, collet or chucked work and has capacity for cylindrical parts up to 4in. in diameter and 18in. long. It already has been adopted for a wide variety of work.

Gear-tooth finishing with serrated cutters has found extensive application. Both rack-type and rotary cutters are used and the operation can be performed at high production rates. One machine, new in 1939, is capable of finishing either spur or helical external gears with a rotary cutter mounted in a head having angular adjustment so that either "crossed-axes" or "parallel-axes" finishing is possible. The slide which carries the cutter head is caused to reciprocate rapidly during the cutting operation, thus permitting the removal of considerable material while producing a fine finish on the work. It is claimed that the combination of rapid reciprocation with high-speed rotation results in highly accurate gears. The rotary tool can have either straight or helical teeth, depending upon the direction of the teeth on the gear relative to the gear axis and the necessary crossed-axis setting required for the best results. When employing the parallel-axis method, a straight-tooth tool is required for spur gears and a helical tool for helical gears. This method is necessary when finishing gears cut close to a shoulder, or grouped in a cluster. One tool can be used for finishing gears having a large range in pitch diameter, so long as the teeth have the same size.

Both a straight-line gear generator and a gear shaper using a disk-type cutter have recently been placed on the market for producing fine-pitch, small-diameter external spur and helical gears at high production rates. The gear generator differs from the shaper in that it employs a rack-type cutter carried in a clapper-type holder. Each of these machines is equipped with a magazine feed and operation is entirely automatic; cutter speeds can be as high as 2,000 strokes per minute. Another 1939 development is a medium capacity vertical gear hobber featuring automatic cycles and hydraulic control. The automatic cycle of this machine employs hydraulic pressure for actuating the hob carriage, clutches and clamping mechanism; mechanical drives to the hob spindle and screw feed; electrical drives to the hydraulic pump unit, coolant pump and work slide rapid traverse. Either conventional or "climb" cutting can be employed, merely by changing the setting of the controls.

Dies and moulds can be completed at one set-up in a rotary-head vertical milling machine recently announced. Layout, and all milling, drilling, boring and slotting operations can be performed without removing the die block from the table of the machine, thereby making possible major cost reductions because of the time saved, as well as insuring the production of more accurate dies. The rotary head carries a vertical spindle which can be set off centre radially and rotated in a planetary motion. Individual motors drive both the head and the spindle. A cherrying attachment mounts directly on the rotary head and ties together the cross-slide and vertical motions of the spindle, permitting circular movements of the cutter in a vertical plane. Because this cherrying attachment also can be used for angular cuts, conical cavities and projections can be generated by combining the cherrying attachment operation with the rotary motion of the head. Attachments for this machine permit slotting, right-angle milling and universal-angle milling operations.

Another interesting milling machine made available in 1939 is the straight-line "Mill-N-Shaver" which combines rough milling with a shaving operation to produce plane surfaces comparable

with those obtained by surface grinding. Essentially, this is a planer-type milling machine having a combination head which performs the rough milling operation during the forward motion of the table, positions the tungsten carbide shaving blade, and then takes the finishing cut during the "rapid traverse" return stroke of the table. Micrometer adjustment is provided for the shaving blade, which automatically is drawn back, out of the way, during the milling stroke.

Bar stock of unlimited length can be threaded in an unusual roll threader now on the market. Operation is entirely different from that of conventional roll threading equipment, which is limited in length of thread that can be produced. In this new machine roller dies take the place of the usual plate dies and are rotated around the work, which is fed through the die head for whatever length is desired. Only the length of the bar stock limits the length of thread that can be obtained. The machine looks very much like a conventional die threading machine, with the chasers being replaced by threaded rollers. Speed of rolling is, in some cases, as much as 50% more than is obtained when cutting threads.

Large-platen hydraulic presses have found much favour in the aircraft industry for forming parts from sheet duralumin, particularly since the development of the Guerin process, patented by the Douglas Aircraft Company. Fundamentally, this process consists of using a block of rubber in the press instead of the customary upper die. Inexpensive lower dies are made from steel, zinc or wood. Sheets of duralumin are placed over the lower dies and the rubber block is brought down so that it engages each die and flows so as to conform to the die contours, producing parts identical in shape with the various dies. When blanking, the pads set up tension between the pressing surface and the periphery of the die, causing the sheet to part along the cutting edge of the die. As many as 35 parts have been formed, or 65 pieces blanked, at one pressing in a hydraulic press of 2,000-ton capacity having 92x72in. platens. (See also TEXTILE INDUSTRY.) (B. C. B.)

Mackay, William Andrew (1876-1939), U.S. muralist, was born in Philadelphia on July 10 and studied at the College of the City of New York, at the Académie Julian in Paris, and at the American Academy in Rome. During the World War he was a chief district camouflage artist of the U.S. Army. Among his many murals in public buildings, those for the Roosevelt Memorial hall of the American Museum of Natural History in New York city are perhaps the most notable. This work, for which he was commissioned in 1933, depicts various historical scenes in the life of Theodore Roosevelt. Mackay also painted murals for the ceiling of the reading room of the U.S. Senate, for the Civic Opera house in Chicago and for the State building of the New York World's Fair. He died July 26 at New York city.

McMillan, John (1873-1939), British Salvation Army officer, was born at Glasgow, Scotland. His parents, who were also attached to the Salvation Army, were transferred to Canada in 1888. After remaining there for several years in various offices he was ordered to Australia in 1896 and rose to Australian field secretary of the army before his return to Canada in 1916. In 1923 he became chief secretary for the British isles, and three years later he was promoted to commissioner and sent to Chicago as commander of the central U.S. territory, where he remained until 1930. From 1930 to 1935 he commanded the eastern U.S. territory with headquarters in New York city, and in 1935-36 he was in charge of the entire Canadian territory. The next year he was appointed chief of staff to Gen. Evangeline Booth and thus became the head executive officer of the world-wide organization of the Salvation Army. He died at London September 22.

McNaughton, Andrew George Latta (1887-), C.B.; C.M.G.; D.S.O.; born Moosomin (Sask.) February 25; son of Robert Duncan and Christina Mary Anne (Armour); educated Moosomin public school, Bishop's college school, Lennoxville, P.Q., McGill university (1906-1910), B.Sc., 1910, M.Sc. 1912, Senior Demonstrator in Electrical Engineering (1912-1914); Honorary LL.D. 1920; married (Sept. 17, 1914) Mabel Clara Stuart Weir: children, Christina Stuart, Andrew Leslie, Edward Dalzell, Ian Armour, Leslie Stuart. General McNaughton served conspicuously in the World War 1914-1918, during which he commanded in succession the 4th Battery, 2nd Brigade, Canadian Field Artillery; the 21st Howitzer Battery; the 11th Brigade C.F.A.; and next was appointed Counter-Battery staff officer of the Canadian Corps. Wounded at the second Battle of Ypres (April 1915) and again at Soissons (Feb. 1918) he was three times mentioned in despatches, awarded the Distinguished Service Order (1917) and made a companion of the Order of St. Michael and St. George (1919).

Upon returning to Canada in May 1919 General McNaughton was appointed member of the committee for the Reorganization of Military Forces of Canada, and in 1922 promoted to Deputy Chief of the Canadian General Staff. In 1929 General McNaughton was again promoted, this time to Chief of the General Staff, a position which he held until asked to be President of the Canadian National Research Council (1935). He served in this capacity until Oct. 6, 1939, when he was appointed to his present position, Commander of the Canadian Active Service Forces. As head of the National Research Council, in addition to contributing numerous papers to technical journals, he particularly directed research in electrical and aeronautical investigations, and was joint inventor with W. A. Steel of the cathode-ray direction finder. At the close of the year (1939) General McNaughton was "somewhere in England" with the First Division of the Canadian Active Service Force, which arrived in the middle of Dec. 1939. (J. T. C.)

McNutt, Paul Vories (1891-), U.S. politician, was born at Franklin, Ind. on July 19 and was educated at Indiana university (A.B., 1913) and at Harvard (LL.B., 1916). He was admitted to the bar of Indiana in 1914 and began his practice at Martinsville in that State. Three years later he was appointed to the faculty of the Indiana university school of law, and he was dean of this school from 1925 until he resigned in 1933 to assume office as governor of Indiana. In 1928 he was elected national commander of the American Legion. He did not support Franklin D. Roosevelt at the Democratic convention in Chicago in 1932, and he was himself mentioned soon afterward as a possible future candidate for the presidency. In 1937 Roosevelt appointed him U.S. high commissioner to the Philippines. While still in that office he returned to the U.S.A., and on Feb. 23, 1938 his friends staged an elaborate testimonial dinner for him in Washington, D.C. which was widely interpreted as an initial move to secure his nomination as the Democratic candidate in 1940. Some political observers freely predicted an open rupture between McNutt and high officials of the New Deal, but President Roosevelt confounded these prophecies on July 11, 1939 when he appointed McNutt first administrator of the new Federal Security Administration.

McReynolds, Samuel Davis (1872-1939), American legislator, was born near Pikeville, Tenn., on April 16 and was educated at Peoples college, Pikeville, and at Cumberland university, Lebanon, Tenn. Admitted to the bar in 1893, he practiced at Pikeville and Chattanooga and from 1903 to 1923 was a criminal court judge in Tennessee. In the latter year he was elected U.S. representative. Two years later

he became a member of the House committee on foreign affairs and, in 1930, chairman of that influential legislative group. Though he was at first a conservative, he became a staunch New Dealer after the election of President Roosevelt and was noted for his championship of the latter's views on U.S. neutrality. He died at Washington, D.C., on July 11.

Madagascar: see FRENCH COLONIAL EMPIRE.

Madeira: see PORTUGUESE COLONIAL EMPIRE.

Magazines and Periodicals. The outstanding fact of the magazine and periodical business during 1939, as of every other, was the coming of the war in Europe. It brought sharp curtailment both in the numbers and the physical size of English, French and German periodicals, and changes of character both to those periodicals and magazines in America. Paper shortages and increasing costs withered away the German art magazines whose rise had featured the previous year; other publications revealed a pronounced decline in number, in typography, and in circulation. In France and England only the sturdiest magazines survived. Old periodicals like *Illustrated London News* and *L'Illustration* filled up with war articles and war pictures, but became thinner in total pages and lost advertising revenue. *Vu* disappeared in France and across the Channel the digest magazines belatedly echoed their great American popularity of a few years before, headed by *Parade*. In all fields there was a marked tendency toward the tabloid, low-cost periodical.

At the same time black-out nights provoked a curious phenomenon in something like a concerted drive for more reading, with Government approval and support. This was reflected in the wide popularity of the periodical book—reprinted books in paper covers, issued like periodicals, either by subscription or for newsstand sale. A single example of this class, *Mercury Books*, under the auspices of *American Mercury*, had some success in the United States.

In the American periodical field the leading developments exhibited a sharp line of fissure between those produced by the war and those preceding it. Among the pre-war changes may be listed the disappearance of *Ken* after a brief and stormy career, and the fact that *American Mercury*, *Saturday Review of Literature* and *North American Review* all changed hands without any noticeable change in content. *Scribner's*, one of the oldest and most respected names in American periodical history, also abandoned publication. Its title was acquired by a firm which also took over *Commentator*, founded as a kind of cross between the digest and news magazines; and a new publication bearing both titles appeared for the first time in November. The magazine, although not radically different from others of the "quality group," was distinguished by its remarkable format, a portion of its pages appearing on the familiar smooth paper with half-tone illustrations, while the bulk were printed on wood-pulp paper.

Also among the pre-war developments was the startling attrition of the movie magazines, perhaps a reflection of declining interest in the movies themselves, with the time-lag usual between events and the reading habits they induce. The pulp fiction magazines, whose decline was one of the outstanding features of 1938, came back strongly, but with a changed character that perhaps reflected an escape psychology generated by the obviously approaching war. Nearly all the new pulps that attained success were devoted to pure or pseudo-scientific fantasy; and the older pulp magazines showed a strong tendency to increase their content of this type of material. In a somewhat analogous field, paper-bound "books" containing collections of comic strips from the daily press, which in other years enjoyed a mild popularity among children, advanced to the status of full-fledged periodicals

of regular issue, and found thousands of new readers—due apparently to the fact that the strips themselves began to carry their endlessly continued stories into more adult fields of interest. Among the general magazines the coming of the war was marked by a shift of content toward serious non-fiction, dealing not only with European topics but American as well. The picture magazines stabilized at about the point they had reached at the close of 1938. Trade journals generally enjoyed a good year, with large increases among those dealing with aviation. Newsstand sales grew at the expense of subscription circulation. At the close of the year there were 6,432 periodicals being published in the United States, an increase over the previous year; 3,466 of these were monthlies, and 1,399 weeklies, both figures showing gains. (FL. PR.)

Great Britain.—Eleven weeks before the outbreak of war Lord Camrose, chairman of the Amalgamated Press, publishers of the most extensive list of magazines in Great Britain, drew attention to the serious disabilities under which the business was then suffering. The effects of the crisis of Sept. 1938 had not passed away.

In January *Criterion*, a high-class literary quarterly founded in 1922, announced its demise, and this was followed in April by the amalgamation of the *London Mercury*, which, especially when edited by its founder, Sir John Squire, had accomplished much for the literary and artistic world in its 20 years, with *Life and Letters To-day*, a 1s. weekly originally founded by Desmond MacCarthy as a half-crown quarterly, *Life and Letters*, in 1928.

Coming nearer the war, the *Era*, a theatrical weekly with a fine tradition dating from 1837, issued its last number in July, and soon after its outbreak the *Windsor* (1895) and *Pearson's* (1896), monthly magazines, as well as the Cambridge undergraduate journal, *Granta*, did the same. Perhaps the crowning disaster in the magazine world was the disappearance with its December number of the *Cornhill*, which from the time of its founding and editing by Thackeray in 1860 had played a leading part in English periodical literature. Among other suspensions during the year may be mentioned: *United Services Review*; *Modern Motoring* and *Popular Motoring*; *Flying*; *Golf Illustrated*; *Good Gardening* and *House and Garden Design*; *Radio Pictorial*, *Screen Pictorial*, and *Television and Short-Wave World*; the *British Musician* and *Musical News*; *Eve's Journal* and *Salesmanship*. Many others were the subjects of amalgamation, as: *Great Thoughts* (1883) with *Sunday at Home and Overseas* (1854), *Melody-Maker* with *Rhythm*, *Film Pictorial* with *Picture Show*, *Film Weekly* with *Picturegoer*, and *World Radio* with *Radio Times*; while Odham's *Passing Show* and *Weekly Illustrated* were incorporated to form the new and highly successful *Illustrated*. Odham's also during the year took over *News Review*, *Parade*, *Armchair Science*, *Gardening* (which was amalgamated with *Ideal Home*), and *Housewife*, a 6d. pocket monthly launched elsewhere in January.

On the other hand, there were a few newcomers, the war itself, and the preparations therefor, being responsible for some, such as *Battle Training* (a 6d. pocket monthly) some A.R.P. and A.F.S. magazines, and some war serials. The new "Pockets" were led by the already mentioned *Housewife*, and include the *World Digest* (Amalgamated Press), *P.T.O.* (i.e., "People, Topics, and Opinion") (Newnes), *Causerie*, and *Horizon*—all 6d. monthlies. *Tomorrow* is a non-political but democratic 6d. weekly; *Cameo* (Pearson), a 1s. monthly, is a "non-fiction library"; and the *Trident*, which incorporates *Blue Peter* (1921), is a 1s. monthly dealing with the sea and oversea travel. (L. H. D.)

Maginot Line. This stupendous chain of defensive works roughly paralleling the entire sweep of France's northern and eastern frontiers derives its name from

André Maginot, French minister of war who, taking office in 1920 managed to secure, the year following, an appropriation of no less than 2,900,000,000 francs toward its construction.

But its beginnings, at least in the minds of certain far-sighted French soldiers, date from a decade earlier. Studies to determine the type and extent of the new fortifications, construction of which was made imperative by Germany's astonishing post-war military and industrial renaissance, were instituted as early as 1920. In 1922 there was constituted a military commission to consider the problem. Working unofficially, first under the direction of Marshal Joffre and, subsequent to his death, under that of General Guillaumat, it finally received, in 1925, full governmental sanction under a decree signed by Painlevé on the last day of that year. A report which it submitted in 1926 was studied by the Supreme War Council throughout 1927. Finally, in 1928, a few tentative fortifications were constructed in an effort to determine the exact line on which the final works should be built—and the nature of the dispositions required.

Following the voting of the appropriations of 1930, the project was commenced in earnest, its main features being completed in 1934. By this time a line 314km. long had arisen—stretching from the Belgian border on the north to Switzerland on the south, and accenting in particular three defence areas, *viz*: the Rhine, the Vosges and the Metz-Thionville sector.

Subsequently, in order to forestall another German "push" through Belgium, the works have gradually been extended to the north-west along the Franco-Belgian border, and are eventually to reach the sea at Dunkerque. This despite the fact that Belgium has constructed, commencing in 1937, her own "Little Maginot Line" with its southern terminus opposite the French fortifications at Longwy, its northern in a crook or elbow running from Eupen to Liège. The initial appropriation toward this effort was the equivalent of about \$33,000,000 (nearly \$4.50 per capita), a tidy sum for a nation of Belgium's size.

Generally speaking, the Maginot Line comprises a series of concrete pill-boxes, blockhouses and strong points connecting France's old fortifications with two gigantic fortresses, Hackenburg and Hochwald, protecting the great iron and industrial regions of Lorraine. Extending eastward from the works proper are row upon row of obstacles to impede the advance either of man or

machine. These include barbed wire entanglements, concealed dry ditches deep enough to entrap a tank, mined areas, serried rows of steel rails projecting unequally from the ground surface (some of these with bundles of explosives attached to be detonated on impact), canals, moats, in short every known passive means for delaying and neutralizing human or mechanized assault.

The active defence elements are much more inconspicuous. Above ground, there is little to reveal the extent of what lies beneath. Prior to the commencement of hostilities the fortress troops were quartered in innocent-appearing model villages, located close by entrances to the tunnels leading to the hidden blockhouses they now inhabit, the medical service holding that subterranean life, when not imposed by war conditions, was inadvisable. But the buildings were of special construction, collapsible at an hour's notice into small components, these to be overstrewn with camouflage and surrounded in a twinkling by dummy trees capable of passing the closest scrutiny of enemy aviation.

With these habitations razed, the visitor sees little evidence of human occupation. Here and there is a small concrete dome set flat upon the earth, for all the world like an inverted sugar-bowl. From some of these will project the muzzles of guns of various calibres; others will reveal merely the presence of ports through which still additional muzzles will issue should an alarm be sounded. Apart from these, plus an occasional ventilator spout squat upon the ground, identical with the millions adorning chimney-pots the world over—no sign of life exists.

But were we able to cleave with a gargantuan blade some of the innocent-looking hillsides upon which these domes and spouts are perched, we would uncover a series of astonishing human ant-hills piercing the very bowels of the earth with as many as seven layers of tunnels, galleries, shafts and storage spaces. The arrangement of one of these has been described as follows:

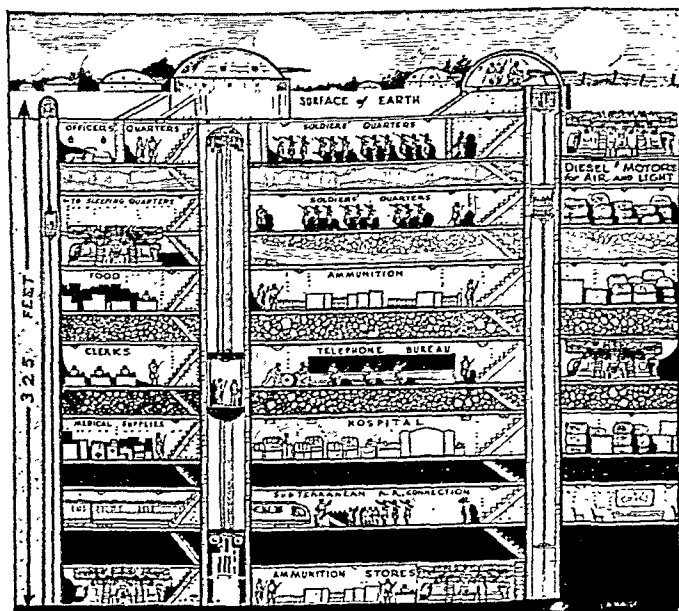
(1) Subsurface layer: officers' quarters, men's quarters, motor-generators for air-conditioning and illumination.

Below this we find:

- (2) More men's quarters, more machinery, storage spaces.
- (3) Food storage, ammunition storage, general supplies.
- (4) Clerical staff, telephone exchange, generators.
- (5) Hospital, medical supplies, reserve stores.
- (6) Electric tramway (connecting at various points with main-line railway spurs), map rooms.
- (7) Reserve ammunition, additional machine installations.

From the lowermost levels to the uppermost extend shafts for freight and passenger lifts supplemented by conventional steel stairways. To reach the interior of a cupola from the subsurface quarters, one ascends hand over hand on a steel ladder leading vertically upward through a narrow shaft. Save where pierced by these, a solid concrete ceiling of considerable thickness covers the topmost gallery, itself in turn being overlaid by a heavy stratum of soil, the whole sufficient to render the spaces beneath both bomb- and shell-proof. Within the beehive itself, space is naturally at a premium, though it is so cleverly utilized that the individual soldier can lead quite a comfortable existence. Bunks are double decked; mess tables fold and clamp against concrete walls when not in use. Washrooms are long and narrow, shower-spaces restricted but adequate. Each blockhouse possesses its independent water supply. Food and other stores are on hand in quantities sufficient to withstand an almost indefinite siege despite the fact that the underground railway connections assure ready replenishment from zones to the rear.

What does such a termite colony represent in human effort? The construction of one large blockhouse is said to have involved the excavation of 700,000 cu.m. of earth from the ground surface, and 50,000 more by subsurface mining. Following this, 120,000 cu.m. of masonry were erected. The volume of earth excavated to promote concealment of the entire line was equal to that which would be removed in building a canal from Paris to Bordeaux.



CROSS-SECTION of part of the Maginot Line, drawn by an artist from information released by French military authorities

The zones swept by the collective fire of the guns, if laid end to end, would more than equal the distance from Pole to Equator!

Strategically, the Maginot Line symbolizes *passive* defence, whereas military engineers hold that the Siegfried Line (*q.v.*) was constructed with a defence *based on the counterattack* as the primary consideration. To pierce the former would appear next to impossible, but certain British critics have suggested that in its very strength lies a measure of weakness. For it endows its defenders with such a sense of security that they, being virtually unable to visualize the possibility of a "break-through," have apparently made little effort to plan the measures to be taken should such a calamity befall. (See also ARMIES OF THE WORLD; EUROPEAN WAR; LIGHTNING WAR; SIEGFRIED LINE; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR.)

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Maglione, Luigi (1877–), Cardinal and Papal Secretary of State, was born at Casoria, near Naples, on March 2. After his ordination to the priesthood in 1901, he entered the Papal diplomatic service. In Feb. 1918, he was sent to Switzerland as the special representative of Benedict XV. Through his efforts, a Nunciature was established at Berne and he was appointed first Nuncio. He was consecrated, Sept. 26, 1920, titular Bishop of Caesarea of Palestine. In 1926 he was transferred from Switzerland to Paris, as Apostolic Nuncio to France. Created Cardinal on Dec. 16, 1935, he was recalled to Rome the following year and served on several Congregations of the Curia. On March 11, 1939, Pius XII named Cardinal Maglione as his successor in the office of Papal Secretary of State.

(F. X. T.)

Magnesite. Since the absorption of Austria and Czechoslovakia, Greater Germany heads the list of world magnesite producers, with a total close to 600,000 metric tons; intermediate producers, with outputs of 200,000–100,000 tons, include Manchoukuo, United States and Greece. Yugoslavia, Chosen, India and Australia range from 50,000 to 20,000 tons. Total output from these producers was about 1,100,000 metric tons in 1937. The Soviet Union reported increases in output of as much as 50,000–100,000 tons a year, reaching 482,000 tons in 1934, but these figures are so large in comparison with internal needs and visible exports that they have been received with considerable skepticism in the industry.

Except for the Russian figures, the only material increases beyond the 1929 level have been in Greece, Manchoukuo, and the United States. United States production of crude magnesite was 203,400 short tons in 1937, while sales included 1,950 tons of crude, 10,030 tons of caustic calcined, and 83,200 tons of dead-burned. This domestic supply was supplemented by 35 tons of crude, 2,800 tons of caustic calcined and 56,000 tons of dead-burned in imports, mainly from Austria and China, with smaller amounts from Czechoslovakia and a number of other producers. Production declined by more than half in 1938. British Empire output is comparatively small, being limited in 1937 to 26,200 long tons in India, 19,700 tons in Australia, and 1,500 tons in South Africa, plus an annual output of 25,000–30,000 tons of magnesitic dolomite in Canada. (G. A. Ro.)

Magnesium. Although magnesium metal has been produced on a small scale for a limited number of uses for a long period of years, it is only since 1922 that its real commercial development began. The metal is now used extensively in a wide variety of light metal alloys, and plant capacity and production are expanding so rapidly that it is difficult to determine current outputs. The estimated 1938 output was 25,300 metric tons,

distributed as follows: Germany, 14,100; United Kingdom, 4,000; United States, 2,200; France, 1,800; Japan, 1,400; Switzerland, 800; Soviet Union, 600; and Italy, 400 tons. Practically the entire output is obtained by the electrolysis of magnesium chloride. Plans are under way for the expansion of production in Great Britain, Japan and Italy. (G. A. Ro.)

Magnetic Mines: see BLOCKADE.

Mail-Order Business, a commercial enterprise which carries on its retail transactions almost entirely by mail, and while found in other parts of the world, has reached its highest stage of development in the United States.

The mail-order business had its inception during the era of rapid expansion following the Civil War. Due to geographical reasons, Chicago, Illinois, became the centre of this business, and remains so to this date. Montgomery Ward started in Chicago in 1872, and Sears, Roebuck and Co., now the largest mail-order house, actually started in Minneapolis, Minnesota, in 1887, but moved to Chicago the following year. Other smaller mail-order companies got their start during this same period.

Isolation of farmers due to poor transportation facilities, high literacy of the American public, increased earning power of the masses, inability of local retailers to meet consumer demands, prices charged by local retailers, convenience of the mail-order method, truthful advertising, guarantee of satisfaction, wide selection of merchandise offered by mail-order houses, combined with the popularity of the parcel post system, all were important contributions to the success of the mail-order method of selling.

Although from its inception the mail-order method of distribution met with a measure of success, it was not until the turn of the century that the rapid expansion of mail-order sales got under way. For example, in 1900 the gross sales of Sears, Roebuck and Co. were \$11,000,000; by 1906 they had increased to more than \$50,000,000. Annual sales continued to increase until by the end of 1939 the combined sales of mail-order and retail operations had reached the huge sum of \$657,061,593, the largest in company history. The course of Montgomery Ward & Co., and other mail-order companies to a more or less degree parallels that of Sears.

The increased expansion noted above is to some extent attributable to large quantity purchases and to operating economies peculiar to the mail-order business, both of which have enabled these companies to raise the general standard of living by making more goods available to consumers at a price lower than they would otherwise have paid. Throughout the history of such houses they have obtained their large sales volume by offering, as a rule, better quality merchandise at the same price, or the same quality at a lower price.

Certain tendencies in the mail-order business are becoming more apparent. Examination of current catalogues reveals an increased emphasis upon private brands: *i.e.* upon merchandise manufactured and sold under the proprietary trade names of the mail-order houses. Such merchandise, placed in competition with nationally advertised brands which are also offered in the same catalogue, has found a ready acceptance with the public. Another tendency is seen in greatly increased instalment accounts, which have resulted not from a lowering of credit standards, but by making available all kinds of merchandise to time payment purchasers. For instance, at the close of 1938 the Customers' Instalment Accounts balance of Montgomery Ward had reached the staggering sum of \$65,141,841, while that of Sears, Roebuck and Co. amounted to \$53,987,455.

In the middle of the 1920's, the two largest mail-order houses, commonly known as Sears' and Wards, entered the retail store

field. This new activity was largely experimental until about 1928, when the two companies, apparently believing that they had learned enough about retail store operation to justify considerable expansion in this field, opened retail units in a number of communities. By the end of 1939 Sears' were operating over 500 stores, and Ward's in excess of 600. By this time, too, it was clear that the original function of the two mail-order houses had been modified by the added function of acting as jobbers to their own retail stores, whose sales it is estimated are running over 60% of total sales.

Despite the success of these two companies in the retail store field, the mail-order system is probably the most economical method yet discovered of distributing goods over a wide area. It is not only economical but renders a great service to people living in remote sections of the country. The potential market of the mail-order houses is, therefore, still a large one. An aspect of the business under discussion which is often overlooked is its influence—because of its large purchases—on factory production and employment throughout the country. (See also *MARKETING; RETAIL SALES.*) (J. G. ME.)

Maine, extreme North-eastern State of the United States, admitted as a State in 1820 and popularly known as the "Pine Tree State," has an area of 33,040 square miles. Population (census 1930) 790,182 (estimated 1939, 824,500). The capital is Augusta, 17,198; the largest city, Portland, 70,810. Of the State's population, 292,793 live in the twenty incorporated cities.

History.—In Jan. 1939, Lewis O. Barrows, of Newport, was inaugurated for his second term as governor, having been re-elected in Sept. 1938. In the same month three Republican representatives re-elected in 1938 took their seats in Washington: James C. Oliver, of Portland (first district), Clyde H. Smith, of Skowhegan (second district), and Ralph O. Brewster, of Dexter (third district). Brewster, former governor, later in the year announced his candidacy for the Senate seat to be vacated in 1940 by the retirement of Senator Frederick Hale. Governor Barrows announced his intention to campaign for the same position. Several Republicans and one Democrat prepared to fight for the governorship in 1940. Maine's legislature, meeting in regular biennial session, pondered tax reform, but decided to continue the State's narrow tax base, depending largely on auto, gasoline, liquor and real estate levies. Proposals for an income tax law failed of passage, as in previous years. No major bills were passed; the Department of Health and Welfare was reorganized and a host of minor bills and amendments were approved. Several municipalities were granted the right to adopt the manager form of government. Dog racing, lottery and liberal old age pension bills were killed. A proposed constitutional amendment increasing the State debt limit to permit additional highway bonds was defeated by the voters in Sept. 1939. Old age assistance appropriations were increased without passing any major tax bills. Part of the money was found by cutting other appropriations, part by assessing the cities and towns for one-fourth of the cost, an equivalent sum being returned to localities for local road work from gasoline tax revenues. Unable to meet payments from regular revenues, the State dipped deep into the sinking fund reserve. The percentage of persons 65 years of age and older is larger in Maine than in all but one or two States. According to 1930 figures there were 69,010; by 1939 the number had increased, but no definite figures were available. By Dec. 31, 1939, approximately 28,165 of this age group had applied for old age assistance; 13,977 had been granted aid, and the monthly payment averaged \$20.64. However, in spite of financial difficulties, the governor stated that a special session of the legislature would not be needed in 1939. In late December the *Bangor Daily News* published a series of front page stories with accom-

panying tables purporting to show irregularities in the transfer and accounting procedure of the State, and ridiculing claims of a balanced budget. Political sabotage and inadequate funds seemed to critics to prevent effective operation of the (1937) merit system act.

Education.—Maine continued to be low in its expenditures for rural schools compared with a majority of States. The legislature re-enacted the \$200,000 annual "equalization fund" which has relieved the situation somewhat since 1937.

Charities and Correction.—The population of State institutions for criminals and mental patients continued to increase and existing buildings remained inadequate, but the legislature of 1939 provided no money for new construction during 1939-40.

Banking and Finance.—Savings bank deposits continued at high levels during the year 1938, while interest rates were somewhat above those in Boston and New York and varied widely within the State.

Agriculture and Manufactures.—Maine continued to lead the potato States with 1939 production lower than the average. Estimated income was about the same as in 1938, but not over half the amount of the peak years, 1929, 1936. Estimated yield in bushels: 1938, 39,600,000 (figure revised, 1940), 1939, 38,250,000. With Federal assistance, timber owners salvaged much of the timber blown down in the 1938 hurricane, and expected to receive higher prices than usual. General business conditions, following national trends, were better than in 1938. The tourist trade topped the previous year, yet was below 1937. Gasoline taxes reached new high levels. Unemployment compensation payments decreased substantially from 1938. The State employment service registered fewer persons than in 1938, but increased the proportion of placements, especially in private business. As the year closed, official estimates showed 325,000 social security numbers issued in Maine, as compared with the estimate a year ago of 293,556 (corrected figure 289,308). WPA rolls indicated a drop of 40% from 1938.

(E. F. D.)

Maize: see CORN.

Malacca: see STRAITS SETTLEMENTS.

Malaria. Malaria has spread following in the wake of the spread of the mosquito *Anopheles gambiae* in the northern part of South America. This mosquito was formerly found only in Africa where it was recognized as the most efficient vector of malaria in the whole world. In 1930 it was discovered at the port of Natal in northern Brazil, having been introduced apparently by ship or aeroplane from West Africa. Soon after its discovery in Natal, the city suffered the most severe outbreak of malaria in its history. The following year the mosquito had travelled more than 100 mi. up the coast, and in 1938 had doubled its distance of travel and caused over 50,000 cases of malaria in the State of Ceará, Brazil.

In certain districts 10% of the population died and agriculture was ruined because of lack of labour. This mosquito is especially dangerous because it is easily infected with malaria; it prefers to bite man rather than animals; and it prefers to live indoors and may even breed there. It also flies farther than most *Anopheles*. Probably this mosquito will soon invade the river valleys of northern Brazil. If it does, it will probably be beyond control and will eventually invade Central America and possibly North America. For this reason, the Rockefeller Foundation appropriated \$100,000 and the Brazilian Government an additional large sum in order to attempt to stop the advance in 1939.

In the United States, malaria is continuing a downward trend for the sixth consecutive year. This is longer than in previous natural cycles of the disease, but it is not yet known whether it

is due to unfavourable breeding conditions because of the drought in the latter part of the summer of 1939 or to the extensive drainage of breeding places which has been continued with the help of the Federal relief agencies. The only unfavourable circumstance reported in the United States is the continued occurrence of highly fatal malaria among morphine and heroin addicts. These addicts transfer malaria from one to another by hypodermic needles used for the intravenous injection of their drug, dividing a large dose among several persons and transferring a little blood from one to another.

Advances have been made during the year 1939 in our knowledge of the immune reactions in malaria. The complement fixation test, described in 1938 for monkeys, is applicable to man, using monkey malaria parasites for the test. This demonstrates antibodies in the blood serum of the infected individual and may be of assistance in the diagnosis of obscure cases. It has also been shown that agglutinins appear in the blood of infected monkeys, which will cause clumping of the parasites causing the infection. Protective antibodies have also been demonstrated in the blood serum of monkeys which have recovered from the acute infection. This serum, when injected into fresh monkeys which usually die of the infection, prevents a fatal outcome. The complement fixation antibodies can be produced by killed malaria parasites but the agglutinins and protective antibodies can be produced only by the living parasites.

The only significant advance in the treatment of malaria is the discovery that sulphanilamide will cure monkeys infected with the parasite *Plasmodium knowlesi*, although it has no effect on another monkey parasite, *P. imui*, and little if any effect on the malaria parasites of man. It was found that the effect of the drug on *P. knowlesi* is associated with a cessation of the use of oxygen by the parasite, and it is believed that this test, which is a simple one, may be used in the search for other anti-malaria drugs.

In the southern United States, *Anopheles* breeding places have been studied in minute detail to determine the relation of plants, microscopic animals, light and various degrees of acidity and alkalinity of the water to the development of the larvae. This is done in the hope that some simple method may be found of making water unfavourable for the development of the mosquito.

During the last decade a number of varieties of the species *Anopheles maculipennis* have been discovered, some of which bite man and transmit malaria, and others of which do not. Attempts to cross these varieties by interbreeding have been unsuccessful, indicating that there is little danger of one variety changing into another and thus acquiring the ability to transmit the disease. Attention is now being directed by the Rockefeller Foundation to malaria in Egypt where it presents problems quite different from those in Europe and where the problem is different in the Nile delta from that in the oases of the desert.

In India, extensive studies of the conditions responsible for the occurrence of malaria have been continued, indicating that much of the problem is the result of man-made breeding places which could be eliminated by intelligent engineering and agriculture. Vast irrigation projects for the cultivation of land during the past century, and even in recent years, have been developed with such disregard to malaria prevention that unnecessary *Anopheles* breeding places have been produced and malaria has been tremendously increased as a result.

Malaria control has advanced steadily in the southern United States through the extension of studies, screening, and permanent drainage conducted by various State and local health departments. The most noteworthy advance has been in the construction of drainage ditches lined by concrete inverts with side walls of concrete, stone or sod. In Mississippi alone since 1933 malaria control drainage has been carried on with the help of Federally subsidized

labour in 225 towns in 76 counties and has affected more than 600,000 people or approximately one-third of the population of the State. Since 1936, when concrete ditching was started, 114 mi. of such ditches have been constructed. This is an illustration of what can be done by co-operation of national, State and local agencies. The control of *Anopheles* breeding around the lakes created by the Tennessee Valley Authority has continued to be satisfactory and methods have been devised to reduce its cost. The greatest problem in this area will be created by the completion of the Gilbertsville dam when extensive areas of Tennessee and Kentucky will be flooded and where the relatively flat nature of the land will make the control of breeding much more difficult.

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Malaya, British: see FEDERATED MALAY STATES; STRAITS SETTLEMENTS; UNFEDERATED MALAY STATES.

Malta: see BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Manchoukuo (MANCHURIA), an Empire, closely connected with Japan, located in north-eastern Asia, bounded on the north and east by Siberia, on the west by Siberia, outer Mongolia and China proper, on the south-east by Korea. Its capital is Hsinking; its ruler the Emperor Kangle.

Area and Population.—The area is 460,383 sq.mi.; its population (June 30, 1936) 33,836,898, including about 700,000 Koreans, about 230,000 Japanese, about 50,000 white Russians and some 3,500 foreigners of other nationalities, among these 434 British, 439 Germans and 226 Americans. Population of chief cities: Hsinking (1936) 307,602; Harbin (1936) 462,602; Mukden (1936), 534,638; Antung (1936) 166,238.

History.—The League of Nations passed a resolution recommending non-recognition of Manchoukuo; and for six years after its establishment Japan and the Central American Republic of El Salvador were the only countries to extend *de jure* recognition. Italy recognized Manchoukuo on Nov. 30, 1937; and Germany maintains a special trade representative in Hsinking. In 1938 Germany extended full recognition, and Poland *de facto* recognition to Manchoukuo. The United States and Great Britain maintain consulates in Mukden and Harbin; and their consuls deal with the established authorities on an informal basis.

Education and Religion.—As of June 1938, there were 16,002 elementary schools (1,422,386 pupils and 33,505 teachers); 137 secondary schools (14,835 pupils and 1,959 teachers) and seven colleges (1,765 students and 228 teachers). Illiteracy is very high, especially in the country districts. The principal religions are Buddhism, Taoism, Mohammedanism and Lamaism. There are about 100,000 Christians in the country.

Armed Forces.—Besides the Kwantung army, the size of which is kept secret, Manchoukuo maintains an army of 80,000 and a flotilla of 15 gunboats, a destroyer and 6 patrol vessels.

Finances and Banking.—The unit of currency is the Manchoukuo yuan, equivalent in value to the Japanese yen (23.65 U.S. cents). The budget, which has been increasing in size, amounted to 420,454,000 yuan in 1939. The Central Bank of Manchoukuo controls the note issue; the Industrial Bank of Manchoukuo specializes in crediting industrial enterprises; and there are a number of other Japanese and Manchoukuo banks.

Trade and Communications.—Manchoukuo's exports and imports in 1937 were valued at 645,297,656 yuan and 887,411,696 yuan respectively. Japan supplied 627,229,748 yuan worth of imports and purchased 277,087,993 yuan worth of exports. Manchoukuo's exports amounted to 725,454,000 yuan in 1938, while

imports were valued at 1,274,748,000 yuan. In this year Japan supplied over 80% of Manchoukuo's imports (993,413,000 yuan) and purchased almost 60% of its exports (416,825,000 yuan). Manchoukuo has about 6,000 mi. of railway lines, of which about 2,000 were constructed after the creation of the new State. The principal towns are connected by a regular commercial air service.

Agriculture, Natural Resources, Manufactures.—Manchoukuo's most important crop consists of soybeans. Kaoliang, millet corn and wheat are also produced in substantial quantities, together with small amounts of rice, cotton and tobacco. In 1937, Manchoukuo produced 4,200,000 tons of soybeans (value 273,000,000 yuan); 4,441,690 tons of kaoliang (value 266,501,400 yuan); 3,451,000 tons of millet (value 189,805,000 yuan); 2,261,000 tons of maize (value 128,877,000 yuan); 1,156,300 tons of wheat (value 115,630,000 yuan). The effect of Japan's war economy became much more pronounced in Manchoukuo during 1938 and 1939. There was an almost inflationary rise in prices; an actual shortage of labour developed; the peasants showed a tendency to hold back goods from the market. There was an effort to push through a five year plan of industrial production (supposed to run until the end of 1941) with a view to increasing the output of the mining and machine-building and chemical industries. While some increases in production were registered there were considerable difficulties with supplies of raw materials and of trained labour personnel, and the term of the plan has been extended to 1943.

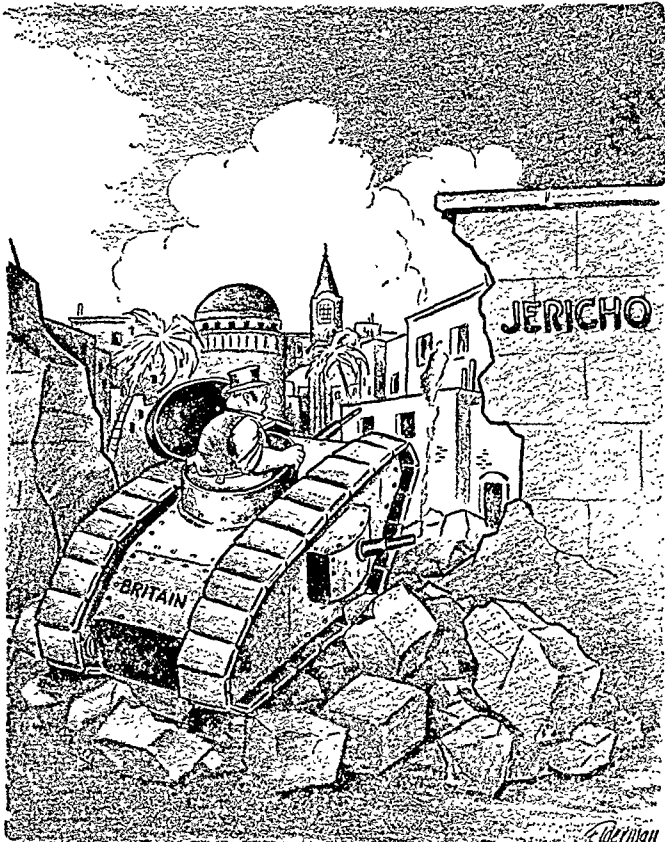
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Mandated Pacific Islands: see PACIFIC ISLANDS, MANDATED.

Mandates. During 1939 the Permanent Mandates Commission met in June and December. In June it examined annual reports from South-West Africa, New Guinea, French Togoland, Nauru, Palestine and Syria. Little comment was forthcoming on the complete pictures presented of the economic, political and social life of the inhabitants of these areas, save in the case of the final two. In Togoland the commission noted the discouragement of transfer of land to Europeans, and it recommended further examination of labour conditions in New Guinea. But Palestine presented a major problem. With the report was the British *White Paper* of May, proposing to terminate the Mandate after 5 years, during which 15,000 Jews might immigrate a year, but after which the British Government would not support development of the Jewish Home, if the Arabs objected. The commission concentrated on the *White Paper*, which, in its unanimous opinion, was not in accord with the interpretation which, in agreement with the Mandatory Government and the Council, the commission had always placed on the Mandate. Proof offered was the British statement of 1937 that the Mandate was unworkable. If it was now

Mandated Territories

Territory	Area	Date of Mandate	Mandatory Power	Former Title	Former Administration
<i>South-west Africa</i> , including Caprivi Zipfel, formerly part of Bechuanaland protectorate.	317,725 sq. mi.	Dec. 17, 1920	Union of South Africa	German South-west Africa	German Empire
<i>Togo</i> , comprising: (1) Togoland, i.e. western section, excluding the seaboard. (2) Togo, i.e. eastern section and seaboard	13,040 sq. mi. 20,000 sq. mi.	July 20, 1922	Great Britain France	Togo	German Empire
<i>Cameroons</i> , comprising: (1) Cameroons adjoining Nigeria (2) Cameroons adjoining French Equatorial Africa	34,081 sq. mi. 161,200 sq. mi.	July 20, 1922	Great Britain France	Kamerun	German Empire
<i>Tanganyika</i> <i>Ruanda-Urundi</i>	360,000 sq. mi. 21,200 sq. mi.	July 20, 1922	Great Britain Belgium	German East Africa	German Empire
<i>Palestine</i> <i>Trans-Jordan</i> <i>Syria and Lebanon</i>	10,100 sq. mi. 34,000 sq. mi. 77,700 sq. mi.	Sept. 29, 1923	Great Britain Great Britain France	Palestine Part of the Wilayat of Syria Syria	Ottoman Empire
<i>New Guinea, Territory of</i> , comprising: (1) North-eastern New Guinea (i.e. the northern section of south-east New Guinea) (2) Bismarck Archipelago (New Britain, New Ireland, the Admiralty Isles, etc.) (3) Certain of the Solomon Islands (Bougainville, Buka, etc.)	93,000 sq. mi.	Dec. 17, 1920	Commonwealth of Australia	Kaiser Wilhelm's Land Bismarck Archipelago German Solomon Islands	German Empire
<i>Western Samoa</i> , comprising Savaii, Upolu, etc.	1,133 sq. mi.	Dec. 17, 1920	New Zealand	German Samoan Islands	German Empire
<i>Nauru</i>	8 sq. mi.	Dec. 17, 1920	British Empire, as represented by Great Britain, Australia, and New Zealand	Nauru	German Empire
<i>Pacific Islands North of the Equator</i> , comprising: (1) Marianne or Ladrone Islands (except Guam) (2) Caroline Islands, comprising the Eastern Carolines and Western Carolines, together with Yap Island and Pelew (3) Marshall Islands	811 sq. mi.	Dec. 17, 1920	Japan	No change	German Empire



JOHN BULL blustered into Palestine "without benefit of trumpets" in 1939, according to Elderman of *The Washington Post*, and was criticized therefor by the League of Nations' Permanent Mandates Commission

workable, a new interpretation must be found. Here unanimity ended. A majority of the commission said the *White Paper's* policy was in accord neither with the terms of the Mandate nor the authors' intentions; and criticized the safeguards for the Jews, the proposals regarding the Constitution and the policy of land settlements and immigration as contrary to Article VI of the Mandate. A minority thought existing conditions could justify the policy, if the Council did not object. The British Government issued a reply not accepting the view of the majority. As the commission is advisory, decision on the question of mandatory policy in Palestine rests with the Council, which however did not meet for this purpose during 1939.

In Syria and the Lebanon the commission approved progress in local administrative autonomy and official measures for centralization and unification, but noted that in places treatment of minorities was not in full accordance with the Mandate. It regretted that the 1936 Franco-Syrian Treaty was still unratified. As the report was silent about the Sanjak of Alexandretta, international considerations apparently overriding the scope of the Mandate, the commission could exercise no supervision.

In December the commission examined reports from Western Samoa, British Cameroons and Togoland, Tanganyika, French Cameroons, and Ruandi Urundi. Japan's report on the Pacific Islands did not arrive. The commission noted British measures encouraging natives to take part in their own administration and safeguards of native interests provided in the demarcation of the frontier between British and French Cameroons. Conditions generally were satisfactory, efforts being made to protect the areas from the consequences of the war. (M. Fe.)

Manganese.

World manganese production in 1937 rose to a new record figure, estimated at 6,000,000 metric

tons, but declined about 6% in 1938. The status of the leading producers is shown in the accompanying table below. The feature of the manganese industry in recent years has been the rapid rise of South Africa from a minor producer to third rank, following the Soviet Union and India; production to the end of Aug. 1939 was 12% below the 1938 level. Gold Coast at the mid-year was well below 1937 while Brazil and India were a bit ahead. No production information is available from the Soviet Union, but exports have dropped heavily; Russian exports through Oct. 1938, the latest available, were only 324,600 tons. Another point of interest brought out by these figures is the status of the Russian output; the Soviet Union is the only important producer which is also a consumer on any appreciable scale, and since production and consumption by minor countries approximately balance, this means that, roughly speaking, the difference between the total output and the total consumer imports for any year is an approximate measure of the amount of the Russian output that has been retained within the country. Since 1934 this amount has been far in excess of any possible demand of the local steel industry, indicating that large amounts are being held in stock.

World Production and Imports of Manganese Ore

(In thousands of metric tons)

Output of Major Producers					
	1929	1932	1936	1937	1938
Brazil	316	20	156	253	222
Cuba	1	10	38	131	124
Egypt	191	..	135	186	54
Gold Coast	415	52	417	536	363
India	1,010	216	826	1,068	902
South Africa . . .	9	..	258	631	552
U.S.S.R.	1,415	832	3,002	2,700?	2,900?
Others	482	159	460	560?	545
Totals	3,840	1,289	5,300	6,000?	5,660?
Imports of Major Consumers					
	1929	1932	1936	1937	1938
Belgium	329	154	154	340	196
France	801	349	421	492	319
Germany	390	107	230	554	426
Norway	161	20	103	131	124
United Kingdom .	294	80	245	288	196
United States . .	671	92	826	927	491
Others	389	127	363	570?	?
Totals	3,035	929	2,342	3,300	?
Difference	805	376	2,958	2,700	?

Partial figures for 1939 indicate a continued heavy decrease in demand in all of the leading consuming countries except the United States, where imports were 20% above the 1938 level, though still far below those of 1936 and 1937. Imports during the first half of 1939 were almost a half less than in 1938 in Belgium, France, and Germany, 20% less in Norway but only about 10% less in Great Britain. Receipt of later data has been hampered by war conditions, and it may be that full information will not again be available until peace is established. (See also METALLURGY.)

(G. A. Ro.)

Manitoba, mid-continent Province of Canada and the oldest and most easterly prairie Province; area: 246,512 sq.mi. (26,789 sq.mi. water); population (census of Manitoba, June 1936), 711,216; urban, 310,927, 44%; British racial origin, 362,389; Ukrainian, 86,982; German, 52,450; French, 47,683; Polish, 35,136; Scandinavian, 21,504; Dutch, 25,521; others, 66,210. Total Canadian-born, 508,300, 70%. Capital, Winnipeg, population (Nov. 1939), 222,454.

History.—The present legislature of Manitoba consists of 55 members, with the Government headed by Hon. John Bracken, premier since 1922.

The lieutenant-governor is Hon. William J. Tupper. Manitoba elects 17 members to the House of Commons of Canada, and has six representatives in the Senate.

Education.—Public, elementary and secondary schools are maintained by general taxation, with the Manitoba university, including a faculty of agriculture, and affiliated colleges, providing for higher education. There are also several other colleges and schools. Pupils in elementary grades, 117,430; in secondary, 21,899. Full-time students enrolled in university, 2,642.

Banking and Finance.—Winnipeg, financial centre of Western Canada, is western headquarters of eight of the 12 Canadian banks, and of insurance, mortgage and financial institutions.

Agricultural, Mineral, Manufacturing, Other Production.—Total value of crops in 1938, \$87,463,000; manufactures, \$140,805,000; mineral production, \$17,175,000; fisheries, \$1,735,000; furs, wild catch, \$669,535; fur farms, \$320,440; processed in Winnipeg, \$376,068; f.o.b. Winnipeg, including furs from other Provinces, \$2,899,914. Canadian Pacific railway mileage, 2,697; Canadian National, 2,965; Midland, 90; Greater Winnipeg Water District operates 110. Highways, including Trans-Canada, 1,731mi. (gravelled, 1,308; bituminous surfaced, 410; concrete surfaced, 13). Province-owned telephone system has 78,236mi. of wires, also 25,000mi. of toll wires for long distance use. Total of phones in Province, 68,931. (W. J. HE.)

Mannerheim Line: see EUROPEAN WAR; FINLAND.

Maple Sugar. Maple products in the United States were materially reduced in 1939 by a poor season and the loss of trees in the Sept. 1938 hurricane. Only 9,670,000 trees were tapped in 1939, compared to 11,672,000 in 1938 and a ten-year (1928-37) average of 12,390,000. The United States maple sugar crop in 1939 was 715,000lb. compared to 1,078,000lb. in 1938 and a ten-year average of 1,548,000 pounds. Syrup was 2,447,000gal. in 1939, and 2,772,000gal. in 1938, the ten-year average being 2,628,000 gallons. In Quebec, 1939 production was 2,715,400lb. of sugar and 1,810,400 imperial gallons of syrup. The 1938 production was 3,212,000lb. of sugar and 2,354,000 imperial gallons of syrup.

U. S. Production of Maple Sugar and Maple Syrup by States

	1939	1938	Ten-year average
	lb.	lb.	lb.
Maple Sugar			
New York	290,000	260,000	328,000
Vermont	279,000	627,000	789,000
Pennsylvania	43,000	43,000	100,000
Massachusetts	30,000	32,000	78,000
New Hampshire	24,000	72,000	88,000
Michigan	17,000	16,000	34,000
Maryland	10,000	10,000	21,000
Ohio	9,000	9,000	32,000
Wisconsin	7,000	3,000	20,000
Maine	6,000	6,000	27,000
Maple Syrup			
	gal.	gal.	gal.
Vermont	843,000	1,485,000	1,002,000
New York	714,000	588,000	736,000
Ohio	370,000	283,000	337,000
Pennsylvania	129,000	95,000	192,000
Wisconsin	105,000	49,000	65,000
Michigan	104,000	64,000	120,000
Massachusetts	64,000	52,000	57,000
New Hampshire	59,000	83,000	72,000
Maryland	25,000	26,000	23,000

(S. O. R.)

Marble and Granite. The production of marble in the United States in 1938 declined slightly to 89,000 short tons, valued at \$4,473,000, two-thirds of which was building stone and one-third monumental stone. Most of the crushed or broken marble sold is waste from the dimension stone branch of the industry; this increased by 16% in 1938, to 130,400 short tons, valued at \$275,200. Canadian production of

marble is small, 18,900 short tons in 1938, a decline of 13% from 1937. Marble production in Great Britain is not of commercial importance, most of the supply being imported.

Granite.—The United States production of granite as dimension stone in 1938 decreased by 10% from 1937, to 672,600 short tons, valued at \$9,778,000; 58% of this was building stone, 22% monumental stone, 5% paving stone, and 10% kerbing; production as crushed or broken stone increased by 15% over 1937, to 9,760,000 short tons, valued at \$11,137,600; 68% of the total was for concrete aggregate or road metal, and 17% as railroad ballast; riprap, which constituted 46% of the 1936 total, was 14% in 1938. Canadian production of granite decreased by 57% in 1938, to 491,400 short tons, valued at \$1,126,400. Production of granite in Great Britain is reported along with other types of igneous rocks, increasing in 1937 by 5% to 10,470,000 long tons, valued at £3,267,000; 91% of the total was used for road metal or ballast.

(G. A. Ro.)

Mariani, Domenic (1863-1939), Italian cardinal, was born at Posta, in the province of Rieti, on April 3. He prepared for the priesthood in Rome and served in various administrative posts under Leo XIII, Pius X, Pius XI and Pius XII. Pope Pius XI created him cardinal in the consistory of Dec. 1935. He died at Vatican City on April 23.

Marine Biology. It is a paradox to find biologists stressing as never before the conservation of life while the war-lords pound away at its destruction. Even while hostilities were brewing, science congresses¹ were in progress to find ways and means of conserving marine forms. Coincident with the outbreak of war in Europe, the Seventh Triennial Assembly of the International Union of Geodesy and Geophysics² was called into session at Washington, D.C., by President La Cour of Denmark, to discuss problems related to the earth's crust, its oceans and its atmosphere, while from Bergen, Norway, came the announcement of the meeting of the International Exhibition for Polar Exploration³ and a conference of polar explorers to be held there in 1940. What the ultimate effect of war will be, cannot be predicted, but already the Dundee meeting of the British Association for the Advancement of Science⁴ has been cancelled, and the projected meeting at Newcastle-on-Tyne has been indefinitely postponed. It seems certain that if protracted, the war will not only draw upon the most competent marine researchers, but will disrupt many programs under way.

Several exploratory expeditions have been initiated, or progress of their scientific work has been reported. The U.S. Government Antarctic Expedition to Little America under the direction of Admiral Richard E. Byrd (Rtd.) is under way, and will extend over a three-year interval, exploring the Antarctic continent and its adjacent waters. The "North Star" left Boston in the middle of November of 1939, taking with it the huge snowmobile, the "Penguin," which is calculated to take the place of dogs and sleds. The barkentine "Bear" will join the "North Star" at the Bay of Whales early in January.

The U.S. Coast Guard cutter, "Hamilton," which was to have sailed from San Francisco in Sept. 1939 with 18 scientists aboard to make an extended study of the island-studded central and south Pacific under the joint sponsorship of the National Geographic Society and the University of Virginia, has been ordered to patrol duty in Atlantic waters.

¹One of the symposia of the Pacific Division of the American Association for Advancement of Science was devoted to conservation problems of migratory fish. *Science*, p. 504 (June 1939). Another program of the Pacific Science Congress held in Berkeley, Calif., had several technical sessions devoted to oceanography and marine biology. See *Science*, p. 454 (Nov. 1939). ²*Science*, p. 339 (Oct. 1939). ³*Science*, p. 236 (Aug. 1939). ⁴See pessimistic note, "The British Association in War Time," *Science*, p. 387 (Oct. 1939). ⁵For features of the forecasted trip see *Science*, p. 173 (Aug. 1939), and for notice of postponement see *Science*, p. 436 (Nov. 1939).

However, the U.S. Geophysical Expedition⁶ to the south-west Pacific, north-east of New Zealand, is under way with its physical and biological program to survey an area of 4,500,000 square miles. The second Fahnestock expedition⁷ to the South Seas, to collect habitat groups for Whitney Memorial Hall of the American Museum of Natural History left New York in the auxiliary schooner "Director II." The all-steel cruiser, "Valero III," of the University of Southern California completed its eighth trip into the southern waters of the eastern Pacific, returning with quantities of rare sea-forms for taxonomic work, and several specimens of the nearly extinct elephant-seals from San Benitos and Guadalupe islands which were donated to the San Diego zoo.

The Committee on Pacific Investigation of the National Research Council of Japan⁸ has proposed extensive studies of the fishes and mammals of the north Pacific ocean. Cambridge university⁹ has initiated a biological expedition to Jamaica to study the topography and life forms associated with the adjacent areas. The British Museum has released Part I of the report of the Great Barrier Reef Australian Expedition which treats of rock-destroying molluscs, zooplankton, copepods, and crustaceans of the region surveyed. The museum also has released a report of the John Murray Expedition of 1933-34 dealing with oceanographic and biological surveys of the Indian ocean and the Gulf of Aden. Detailed reports of many forms will interest the biologist. The new 700-ton non-magnetic ship "Research," to take the place of the "Carnegie," was launched by the British Admiralty¹⁰ on April 4, 1939, and a similar ship of 800-tons displacement is reported to be under construction by the Soviet Government. When completed, the ship will be commissioned for research in the Arctic ocean.

The new 100-ton oceanographic vessel, the "Culver," sponsored jointly by the Development Commission of Great Britain and the Royal Society of London¹¹, entered upon its five-year study program of the Gulf stream using the Bermuda Biological Station as its base, and co-operating with the "Atlantis" of the Woods Hole Oceanographic Institute. The research project involves a dual

program consisting of physico-chemical studies and the extensive biological survey of the stream. The U.S. Bureau of Fisheries¹² announces the commissioning of the "Harvard" to take the place of the "Albatross II," for some time out of service. It will aid in solving commercial fishing problems off the Georges and Nova Scotian Banks. The German State Biological Institute¹³ at Heligoland is investigating the possibility of harvesting the minute organisms (plankton) of the seas to serve as a source of food for man. While it is known that the zooplankton content of sample catches (mostly copepods) has a nutritive value of good meat, and the phytoplankton (plant) the content of good rye flour, it seems doubtful if the undertaking would be a success on a large scale, since it would require the recovery of all plankton from 7.500 cu.m. of sea water to furnish the food-equivalent of the dietary of a man for a single day. On this basis, workers at the Woods Hole Oceanographic Institute conclude, that either richer yield must be discovered or some method be found to increase the catch before it could be of economic or practical value.

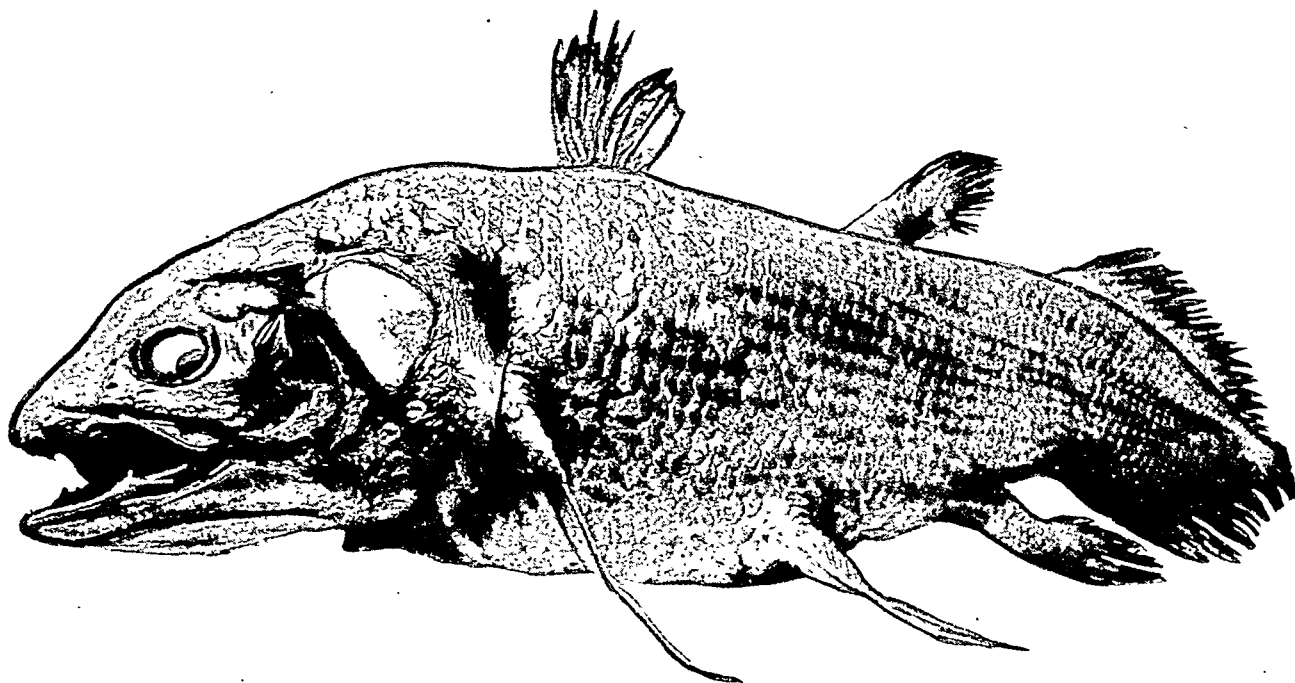
A new Biological Research station has been made available by the South Wales Government at Cronulla.¹⁴ Three new U.S. Bureau of Fisheries laboratories have been established; one at Pensacola, Fla., taking over the abandoned quarantine station on Ballast Rock island; another at the cross-roads between North and South America in Puerto Rico, where at an initial cost of \$25,000, special studies in fish preserving and marketing problems are being initiated. A third Government station is located at Milford, Conn., where in a new specially designed building, research work will be conducted on the propagation of oysters and other commercial molluscs.

A worker in the Carnegie Geophysical Laboratory,¹⁵ using a deep-sea dredge of new design, has obtained mud-samples ten feet in thickness from the sea-floor two miles down in the Atlantic. He concluded that there were four ice-periods; five warm water eras; that the magnetic pole has wandered widely as evidenced by small magnetic particles still pointing in the direction they did thousands of years ago, and that strange gigantic shelled animals dominated one era of the earth's past. Another worker, at the Marine

⁶See *Nature* (July 1939). ⁷See *Science*, p. 437 (Nov. 1939). ⁸See *Nature* (July 1939). ⁹*Nature* (July 1939). ¹⁰*Nature* (March 1939). ¹¹*Science*, p. 29 (Jan. 1939).

THE DISCOVERY OF A LIVE COELACANTH, supposedly extinct for more than 50,000,000 years, off South Africa in Dec. 1938 was described on March 16, 1939, by a jury of British scientists as "one of the most amazing events in the realm of natural history in the 20th century"

¹²*Science*, p. 227 (Sept. 1939). ¹³*Science*, p. 602 (June 1939). ¹⁴*Nature* (Aug. 1939). ¹⁵*Science*, p. 48 (Feb. 1939).



Station at Naples,¹⁶ has successfully isolated "fertilizin" from sea-urchin eggs, an active principle of all fertilization processes. Concerning the direction of some interesting adaptations, a worker in the U.S. Bureau of Fisheries¹⁷ has found that certain fishes and other organisms which usually are found only in salty Atlantic waters, migrate through the locks of the Panama canal and apparently live successfully in the brackish waters of Gatun lake. Some Atlantic forms have even been recovered on the Pacific side. In all, 159 species have been identified, some of which, however, make poor adjustments involving both temperature and salinity changes.

The U.S. Academy of Science award, the Agassiz medal for 1938, goes to the outstanding marine biologist and oceanographer, Harald Ulrik Sverdrup, now director of the Scripps Institute of Oceanography. He is a Knight of St. Olaf, and a member of the Academy of Science of Oslo.

We are reminded¹⁸ that while we associate the penguin with the ice and snow lands of the polar regions they abound in the warmer climes. Thus they are found in innumerable quantities on the islands along the South African coast where they fish and rear their brood along the waters of the warm southern Atlantic ocean. (See also OCEANOGRAPHY; ZOOLOGY.)

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Marine Corps. an integral part of the U.S. Navy, is organized and trained on military lines to fit it especially for duty in the naval service both at sea and ashore. The corps dates from Nov. 10, 1775, when it was authorized by the Continental Congress, and consists of 1,220 commissioned officers, 150 warrant officers, 26,000 enlisted men.

The ranks of officers correspond to those of the Navy, but the titles are those of the Army, from second lieutenant to major general. Marines, 275 officers and 8,000 enlisted men, garrison 36 shore stations, 24 within continental limits and 12 overseas, and 135 officers and 3,200 enlisted serve as part of the crews of 60 sea-going battleships and cruisers of the Navy. The fleet marine force is organized, equipped and trained for service with the sea-going fleet, acting as a landing force to seize, defend and maintain temporary bases that the fleet will require in overseas operations. This force accompanies the fleet on manoeuvres assimilating war conditions. The two brigades of the fleet marine force consist of infantry, artillery, aviation, anti-aircraft batteries, chemical companies, engineer companies and tank companies; total peace strength 320 officers and 6,000 enlisted.

During 1939 an important mission of the Marine Corps was the protection of American lives, interests, and property in China during the Japanese attacks upon China. The U.S. Embassy guard, at Peiping, 20 officers and 500 enlisted, has been maintained in accord with treaty stipulations since the Boxer Rebellion of 1900. In addition to the Embassy guard, a marine regiment, 70 officers and 1,500 enlisted men, has been on temporary duty at Shanghai.

The 20 aircraft squadrons of the Marine Corps, 200 officers and 1,500 enlisted men, form part of the fleet marine force. They are based on marine barracks, Quantico, Va., naval air station, San Diego, Calif., and St. Thomas, Virgin Islands, and move with the fleet base force as required by the needs of the U.S. fleet.

Officers are commissioned from graduates of the Naval academy and distinguished military colleges, and from qualified enlisted men.

¹⁶Science, p. 177 (Aug. 1939). ¹⁷Science, Supp. 8 (Aug. 1939). ¹⁸See an account of these peculiar birds in *Nature Magazine* (Nov. 1939).

The Marine Corps Reserve consists of 1,000 officers and 16,000 enlisted, including aviation units of 212 officers and 1,000 enlisted, based on 15 stations and trained regularly to fit them for assignment to regular duties in time of war or emergency. (D. Wl.)

Marine Insurance: see INSURANCE, MARINE.

Market Gardening. A record acreage of vegetables, or commercial truck crops, for fresh marketing was harvested in 1939 in the United States, 1,747,000ac., or about 1% more than the acreage of 1938. Commercial market gardening in the United States has increased by about 440,000ac., or 34%, in the years 1930-39. All data herein are from reports of the U.S. Department of Agriculture. Production of vegetables in the United States for fresh marketing was the second largest on record in 1939 and only slightly under the all-time-high production of 1938. The decrease in production was mainly because of smaller harvests of cabbage and watermelons. On the other hand, such higher-price crops as asparagus, snap beans, cauliflower, eggplant, lettuce, onions, green peas and peppers reached a new high of production in 1939. The index of production of these higher-priced crops, based on 1924-29 averages, was about 3.5% above that of 1938, or 149.4 of the 1924-29 average and an increase of 27% in the years 1930-39. Prices for these special crops were also higher in 1939 than in 1938 owing to improved consumer buying power, the increase being 7%, which brought the price to 69.8% of the 1924-29 average. Commercial production of principal vegetables in the United States for fresh marketing in 1939, in 1938 and the ten-year (1928-37) average was as follows, excluding potatoes and sweet potatoes:

	1939	1938	1928-37
Asparagus	6,887,000 crates	6,099,000 crates	5,195,000 crates
Beans (snap, green and wax)	16,580,000 bu.	15,107,000 bu.	11,307,000 bu.
Beans (lima)	1,100,000 bu.	904,000 bu.	651,000 bu.
Beets	2,021,000 bu.	1,999,000 bu.	1,899,000 bu.
Cabbage	989,200 tons	1,290,000 tons	925,200 tons
Cantaloupes	14,402,000 crates	14,973,000 crates	14,902,000 crates
Carrots	10,061,000 bu.	10,068,000 bu.	11,587,000 bu.
Cauliflower	8,422,000 crates	8,401,000 crates	6,993,000 crates
Celery	11,327,000 crates	11,808,000 crates	9,123,000 crates
Corn (New Jersey)	114,400,000 ears	110,250,000 ears	110,090,000 ears
Cucumbers	4,650,000 bu.	4,595,000 bu.	4,153,000 bu.
Eggplant	1,092,000 bu.	961,000 bu.	801,000 bu.
Kale (Virginia)	550,000 bu.	514,000 bu.	619,000 bu.
Lettuce (g.r.)	24,006,000 crates	19,076,000 crates	19,433,000 crates
Onions	17,479,000 sacks	15,038,000 sacks	13,797,000 sacks
Peas	9,627,000 bu.	8,505,000 bu.	7,359,000 bu.
Green peppers	5,060,000 bu.	4,970,000 bu.	3,900,000 bu.
Shallots (Louisiana)	674,000 bu.	499,000 bu.	..
Spinach	13,439,000 bu.	12,556,000 bu.	12,472,000 bu.
Tomatoes (g.r.)	24,385,000 bu.	24,724,000 bu.	18,707,000 bu.
Watermelons	65,004,000 melons	72 175,000 melons	68,019,000 melons

(See also TRUCK FARMING.)

(S. O. R.)

Marketing. The wholesaler-retailer system continues as the channel through which nearly three-fourths of all consumer goods reach the public. The direct distribution systems including the department stores, mail-order houses and chain stores have similarly held their own not only in volume of sales but in the service rendered to the consuming public. Through competition they still set the pace in regulating prices and conditions of purchases. The super-market, the department store of the food trades, is the most spectacular development in distribution of the years 1935-39.

To meet the competition of the chains and the super-markets, retailers who buy from wholesalers, both in co-operation with and in many cases without such co-operation, have organized retailers' co-operatives and "voluntary chains" as aids to buying advertising, and other functions. The retailers' co-operatives and voluntary chains now have more units than the corporate chains.

Consumers' co-operatives, an important factor in the distribution of goods in several European countries, are still insignificant in the United States in volume of business transacted, although public interest in this form of distributive ownership and control

seems to be growing. House-to-house selling as a channel of marketing has always been and is still important in the sale of many commodities of common use, such as fresh fruits and vegetables, milk and other food products. The extent of house-to-house distribution in other lines of goods varies with business conditions. The numbers engaged in house-to-house selling tend to increase as general business conditions decline, and tend to fall when business conditions improve.

The even balance of the various marketing systems competing for consumers' trade is threatened by new competitive devices recently introduced by factors from the wholesaler-retailer system. It has been discovered that the numbers of small concerns engaged in wholesaling and particularly in retailing dependent upon wholesalers for their sources of supplies have, when organized and directed, a political potential useful in setting up political disadvantages for their competitors and in securing special privileges for themselves. Similar curbs on direct distribution have been introduced in several European countries usually in the form of prohibitions of further growth or expansion. In the United States such attacks commonly take the form of discriminatory regulation through taxation by State or municipal bodies. By the use of the discriminatory taxing power it has been discovered that it is possible to crush competition. Since the beginnings of such attempts made back in the middle 1920s, there have been more than 1,000 bills introduced of which, however, about 50 have been enacted. On January 1, 1939 there were 19 States and as many more municipalities having such taxes in effect. Some of these tax provisions are mild in effect, others are sufficiently heavy to be confiscatory.

Discriminatory taxes against direct distributions in the United States have taken several forms, such as licence taxes graduated in amount according to the number of stores operated, gross sales taxes, graduated in amount according to the volume of total sales, and store area taxes graduated in amount according to the floor space occupied by the store or stores owned. More recently several States and municipalities have applied the so-called Louisiana principle of the graduated tax against chains, basing the amount of the tax upon the number of units or stores owned, whether owned in the State or municipality affected or not. It is called the Louisiana method of chain store taxation for the reason that such a tax was first passed in that State under the Huey Long regime and has since been upheld by the courts.

In addition to the discriminatory tax schemes referred to above, representatives of the wholesaler-retailer system, with the co-operation of politicians, have (1940) secured the passage of price maintenance laws in 44 States and of still other laws regulating or prohibiting sales below costs, including expenses of distribution, in 23 States. These two types of legislation are respectively termed "fair trade laws" and "unfair practice acts." There has likewise been an effort to prohibit differentials in purchasing prices and other considerations ordinarily based on differences in quantities bought, in what is known as the Robinson-Patman Federal Act of 1936.

These measures whose purpose it is to restrict and hamper direct distribution are certain to have other effects besides those sought by their promoters. If they succeed in restricting and cutting down the competition, there will be less reason for the intense efforts now being made to render efficient service and keep prices down. This will eventually mean higher prices for consumers. Thus, this movement may in the long run awaken wide-spread consumer concern and antipathy. Whatever the legislatures may direct and the courts decide as to the permissibility of such competitive manoeuvres, it seems likely that the final decision will rest with the consuming public. The issues growing out of this method of restricting competition by political action are almost

certain before long to become major political questions. Consumers may have to decide by ballot as well as by patronage on what marketing institutions they may want preserved for their service. (See also MAIL-ORDER BUSINESS; PSYCHOLOGY, APPLIED: *Market Research and Advertising*; RETAIL SALES.)

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Marriage and Divorce. The constructive trends in the field of marriage so apparent in 1938 have not only continued but were accelerated in 1939. The history of divorce has been uneventful with no indication as yet that the increasing divorce rate has begun to recede. Public interest throughout 1939 turned toward efforts to conserve the family and marriage rather than to deal with the divorce problem. This indicates the growing conviction that the latter is a symptom of conditions that make for marital instability rather than a cause. (See also LAW (CASE): *Domestic Relations*.)

When the year is surveyed the most impressive indication of this greater nation-wide attention to the needs of marriage and the family is the number of well-attended meetings that were fact-finding, but forward-looking. Among the most important of these were: The Midwest Regional Meeting of the National Conference on Family Relations at Chicago, the Southern Regional Meeting of the National Conference on Family Relations at Baton Rouge, La., the Washington State Conference on Family Relations, at Seattle, Wash., the Fifth Annual Conference on the Conservation of Marriage and the Family, at Chapel Hill, N.C., the Conference on Education and Problems of Family Life at the University of Chicago, a session given over to Marriage and the Family at the meeting of the Eastern Sociological Society, at Asbury Park, N.J., the Sixth Biennial Conference of the National Council of Parent Education at Detroit, Mich., the White House Conference on the Child in a Democracy at Washington, D.C., the Oklahoma Family Life Institute of the University of Oklahoma, the Buffalo Social Hygiene Institute held prior to the National Conference of Social Work, the Marriage Conference organized by the Lafayette college students, and the very significant American Congress on Obstetrics and Gynecology at Cleveland, Ohio. This conference, the first attempt to draw together the medical and mental hygiene aspects of marriage, was enthusiastically supported by doctors, nurses, social workers and educators representing every section of the United States. Sponsored by the American Committee on Maternal Health, it was not only one of the most significant events of 1939 but also one of the most important contributions to the welfare of marriage during the last decade.

The increase of courses in colleges in preparation for marriage, noticeable in 1938, continued in 1939. Wherever these have been factual and sincere attempts to meet the needs of youth, they have met with a response from college students without parallel in the history of American education. One consequence of this marked interest has been the tendency to increase the attention given marriage in the more orthodox courses on the family. The University of North Carolina and Duke university co-operation in a program for the preparation of those planning to teach marriage and the family or to act as marriage counsellors began in the fall semester of 1939. This program is the first to specialize in graduate training of teachers and includes what appears to be the first course on problems of marriage ever offered by specialists of a medical school.

The development of courses in preparation for marriage among the colleges is beginning to influence educators in the secondary schools who realize that their youth for the most part will not continue their education beyond the high school. Various experi-

ments seeking to give high school students better preparation for marriage and parenthood are in operation and, during 1939, there was decided increase of interest in this sort of instruction. This led the American Association of School Administrators to choose as the subject of their 1941 Yearbook, prepared by its Commission, *Education for Family Life*. Various social agencies have also during the year extended or inaugurated specific courses dealing with marriage and family life as part of an adult educational program. The Henry Street Settlement course of lectures is representative of these new undertakings and the work of the Young Men's Christian Association and Young Women's Christian Association and especially the American Association of University Women illustrates the extension of former interests in marriage and the family. The radio has had an important part in the distribution of information attempting to conserve and improve marriage and the family. A special undertaking that deserves mention has been the half hour radio dramas attempting to interpret the contribution of women to the development of American life and thought.

Religious leadership showed a marked increase of interest in the conservation of marriage and the family during 1939. The Committee on Marriage and the Home of the Federal Council of the Churches of Christ in America, and the Family Life section of the National Catholic Welfare conference had an important part in directing this interest in the Protestant and in the Catholic Churches. Counselling by the clergy, especially through a conference prior to the wedding, is rapidly becoming a professional obligation. A changing attitude toward the problem of divorce on the part of the Protestant ministry is indicated by the increase of instruction in preparation for marriage offered in churches and especially by pressure on the divinity schools to include in their instruction more adequate preparation for marriage and family counselling.

Possibly the most revealing evidence of the movement in public thinking away from divorce as a problem to emphasis on efforts to conserve marriage and the family has been the articles that have appeared in popular magazines stressing the need of preparation for marriage. These are written in different mood than former discussions of the divorce evil and reflect the conviction of the editors that the public is taking a new and more realistic interest in marital problems.

During the year there also were numerous indications of a changing philosophy especially among those who as specialists are concerned with the problems of marriage and the family. Addresses reported in the press indicate that there is a lessening tendency to hold parents responsible for childhood mishaps that are believed to be causes of life maladjustments and to recognize the great part that social conditions have in these occurrences. There is also a decided shift of public opinion toward greater sympathy with the difficulties of young people due to prevailing social conditions. These changes in thinking are in part responsible for the very great increase of interest in educational and legislative programs for the advancement of the welfare of marriage and the home. In legislation the trends have been toward more regulation of marriage licences, more attention to the custody problem of children, and most of all toward pre-marriage health examinations. The progress of 1938 in the effort to curb venereal disease, especially syphilis, continued. Nine additional State legislatures passed premarital, and 14 enacted prenatal examination laws. Connecticut, the first State requiring a blood test for syphilis as a prerequisite for marriage, where the law has been in operation for over three-and-a-half years, reports a decrease of more than 50% in cases of congenital syphilis under one year of age, when the record for 1936 is compared with that of 1938. The attack on gonorrhoea also became more aggressive during the

year, in part due to the efficacy of treatment with sulphanilamide. The exhibit, Social Hygiene in Your Town, at the New York World's Fair, attracted 250,000 visitors. An appropriation of \$5,000,000 for financial assistance to the States and territories in venereal disease control work for the year beginning July 1, 1939, was authorized by Congress. There was an increase in the laboratory facilities maintained by States, by municipalities and by private hospitals for the testing for venereal diseases, in part due to the demand created by recent anti-venereal legislation. There has also been an improvement in the technique of the testing, lessening the expense and adding accuracy.

Greater popularizing of contraceptive birth control was a marked feature in 1939. In Connecticut, in contrast with the supreme court decision of Massachusetts, the prosecution of the Waterbury Maternal Health Center led to the opinion that even though there were no specific exceptions for the medical profession in the statute forbidding the distribution of birth control information, the intent of the law could not have been to interfere with lawful medical practice. There is a tendency for birth control centres to extend their function so as to include marriage counselling and fertility advice, and for leaders in the birth control movement, on account of the decreasing birth rate, to recognize the need of a broad maternal health program designed to encourage births as well as to give contraceptive advice. The State of North Carolina has gone farther than any other in furnishing contraceptive services as a part of the public health program, and now has 65 birth control centres. (E. R. G.)

Marshall, George Catlett (1880—), U.S. Army officer was born at Uniontown, Pa. on December 31. He studied at the Virginia Military institute from 1897 to 1901 and graduated from the Army Staff college in 1908. Commissioned second lieutenant of infantry on Feb. 2, 1901, he advanced through the grades to brigadier-general in 1936. In 1902 and 1903 he served in the Philippines, also from 1913 to 1916. He was an instructor at the Army Staff college after his graduation there, from 1908 to 1910, and was with the American Expeditionary Forces to France in 1917, on the general staff of the First Division, as chief of operations of the First Army and as chief of staff of the Eighth Army corps. He saw action at the battle of Cantigny and throughout the Aisne-Marne, St. Mihiel and Meuse-Argonne operations. After the war he was for five years aide-de-camp to Gen. John J. Pershing. From 1924 to 1927 he was stationed in China, and from 1927 to 1932 he was assistant commandant at the U.S. Infantry school. He was appointed commander of the 8th infantry in 1933 and commanding general of the Fifth brigade in 1936. On April 27, 1939 President Roosevelt appointed him Chief of Staff of the U.S. Army with the rank of full general, to succeed Gen. Malin Craig, and he assumed this office August 31. Gen. Marshall wears the Distinguished Service medal, the Victory medal with five bars, and the Croix de Guerre with palm.

Martin, Edward Sandford (1856–1939), American author and editor, was born January 2 at Willowbrook, Owasco, N.Y., and was educated at Harvard university, where he received his bachelor's degree in 1877. The year before his graduation he helped found the Harvard *Lampoon*. In 1883 he founded and became first editor of the old magazine *Life* and wrote consistently for that journal until 1933. He also contributed regularly to *Harper's Weekly* and was its assistant editor from 1893 to 1913. Among his published works are *Pirated Poems* (1890), *Cousin Anthony and I* (1895), *Lucid Intervals* (1900), *Unrest of Women* (1913), and *The Diary of a Nation* (1917). He died in New York city on June 13.

Martin, Helen Reimensnyder (1868–1939), American author, was born on October 18 at Lancaster, Pa., the daughter of a Lutheran minister. After a period of study at Swarthmore and Radcliffe colleges, she began to write short stories about the Mennonites of Pennsylvania. The "Pennsylvania Dutch" were the subject of most of her 30 novels, among which were *Tillie, A Mennonite Maid* (1904), *Barnabette* (1914; dramatized as *Erstwhile Susan* and played by Minnie Maddern Fiske), *The Marriage of Susan* (1921), *The Snob* (1924), *Challenged* (1925), *From Pillar to Post* (1933) and *Emmy Untamed* (1937). She died at New Canaan, Conn., on June 29.

Martinique, a French West Indian colony; language, French; capital, Fort-de-France; governor, M. Décharte. The area is 385 square miles. The population (246,712 in 1936) was officially estimated at 255,000 in 1938. The chief cities are: Fort-de-France, 48,395; Le Lamentin, 16,303. Martinique is administered by an appointed governor and an elected council, and is represented in the French parliament by a senator and two deputies. Fort-de-France is the French West Indian naval base and military headquarters. It has direct steamship connections with France, which were somewhat disturbed by conditions resulting from the European war, and with other parts of the West Indies, and air transport communication with New York. The colony has 600km. of automobile highways and 200km. of exclusive freight railway. Imports in 1938 amounted in value to \$7,449,000 and exports to \$8,127,000, compared with \$8,634,000 and \$9,312,000 respectively in 1937. Imports are principally foodstuffs, tobacco, lumber and textiles, of which France supplies approximately 70%. The chief exports are sugar, rum, bananas, pineapples, and cocoa beans, almost all of which goes to France. Approximately 45,000ac. of sugar cane is cultivated. Refining is done by 19 sugar mills, capitalized at 50,000,000 francs. There are two rum distilleries. The monetary unit is the French franc (value: 2.25¢ U.S.). The budget was balanced in 1937 at 101,100,000 francs.

Martinique has more than 100 primary schools, and several secondary and technical schools, with an enrolment in excess of 12,000. (L. W. BE.)

Maryland, one of the original 13 States. Area 12,300 square miles. Population (1939) 1,795,646, in 1938, 1,777,905. Annapolis (population estimated, 1940, 13,848) is the capital; Baltimore (population 868,990) is the metropolis and one of the chief seaports of the country. The State birth-rate for 11 months of 1939 was 15.9, in 1938 (12 months) 17.1. The death-rate 1939 (11 months) 11.6, in 1938 (12 months) 11.6. Infant mortality 1939 (11 months) 49.9, in 1938 (12 months) 54.4.

History.—Among the important laws passed at the regular biennial session of the General Assembly two provided for the creation of separate conservation commissions; one to regulate oyster culture and the oyster industry; the other to supervise the propagation, protection, etc. of wild fowl, game, and "inland" fish. The State Welfare department was reorganized. And an end was made of the old county and district coroner system. In its stead was created a department of Post Mortem Examiners headed by an unpaid commission vested with authority to appoint medical examiners and to direct their work. A Legislative Council was created to collect information concerning the State Government, to supervise the interim work of committees and to prepare a legislative program in the form of recommendations at the next session of the General Assembly. Seven proposed constitutional amendments to be referred to the voters provide for an additional judge on one circuit, determining the residential qualifications of the

judges on another circuit; increased pay for members of the General Assembly, making the incumbent governor ineligible for a second consecutive term, appointing the clerk of the Court of Appeals instead of electing him, establishing people's courts in the counties. The last stipulates that the compensation of judges and other public officials shall not be exempt from the imposition of the State income tax. The new State office building in Annapolis designed to house all offices, most of them in Baltimore, was completed and is being occupied.

For the fiscal year ending Sept. 30, 1940 the budget totals \$49,967,245 including \$5,000,000 from the Federal Government and \$2,543,000 from State bond issues. These figures compare with \$41,556,339, \$2,683,309, and \$2,200,000 respectively for 1939.

Roads and Bridges.—The year 1939 saw the completion of the Ritchie Memorial highway, a dual road between Baltimore and Annapolis and most of the new road to Philadelphia, also dual. Work on the long bridges over the Potomac river at Morgantown and over the Susquehanna above Havre de Grace has progressed to the point where the opening of both on scheduled time (June 1940) is assured. The other bridges over the Potomac at Shepherdstown, Point of Rocks, and Hancock were completed. These replace structures which were washed away in recent floods; plans to replace the fourth, which suffered the same fate at Harper's Ferry, call for a new bridge at Sandy Hook farther down the stream. And a new bridge across Church creek connecting two parts of Cambridge on the Eastern Shore was opened. Automobile fatalities in 1939 totalled 415, in 1938 totalled 419.

Education.—The number of pupils in the public elementary and high schools is 299,478 and of these 63,402 are Negroes. The total for the preceding year was 293,686. Roman Catholic elementary and high schools have an enrolment of 48,249. Private schools in the State have 6,937 pupils. To provide higher educational facilities for Negroes and keep the races segregated the State acquired Morgan college, a Methodist school established in 1869, where courses comparable to those offered in State supported schools for whites will be offered.

Banking and Finance.—Trust companies and banks (115) had resources (June 30, 1939) of \$370,175,330 compared with \$328,443,709 (Sept. 28, 1938); deposits \$321,045,690 compared with \$277,692,861 in 1938. Mutual savings banks on June 30, 1939 had resources amounting to \$251,750,480 compared with \$250,373,897 the previous year. Deposits were \$224,525,107 in 1939 and \$223,285,015 in 1938.

Agriculture, Minerals, Manufactures.—Total acreage for all field and truck crops in 1939 was 1,652,200; in 1938 1,718,500. The "farm crop value" in 1939 was \$44,503,000, in 1938 \$43,676,000; the total cash income from sales amounted to \$65,700,000 in 1938 and \$75,520,000 in 1937 including about \$1,500,000 in Federal subsidies for each year. Oyster production Sept. 1, 1939 to Jan. 3, 1940 amounted to 2,136,940 bushels. This represents about half the length of the current season; same period a year ago 2,114,704 bushels. Hard crabs 1939, 250,594bbl., an increase of 50,601bbl.; soft crabs and peelers by number 12,924,376 in 1939, an increase of 1,713,556. In 1938, 1,306,000 tons of coal were mined, in 1937 1,570,000 tons. The value of other minerals in 1938 was lime and limestone \$1,055,072, miscellaneous stone including slate \$672,904, granite \$272,667, basalt \$101,292, asbestos, etc., \$262,232, sand and gravel \$1,831,548. The 1937 comparable figures are \$919,780, \$342,936, \$291,423, \$274,394, \$404,437, and \$2,236,132 respectively. The value of manufactures in 1937 was \$1,095,862,972 compared with \$757,852,170 in 1935. (ED. EL.)

Mason, Walt (1862–1939), American humourist and writer, was born on May 4 at Columbus, Ontario. His education was haphazard and he drifted into New York State in

1880 to become a farm labourer there. Soon he wandered westward and eventually settled at Atchison, Kan. where he was a reporter on the *Globe* for two years. After working sporadically on other papers he met William Allen White, who gave him a job on *The Emporia Gazette* and encouraged his fondness for writing poetry. His homespun "prose poems," first contributed to the *Gazette*, were later syndicated throughout the United States. Mason was also author of *Uncle Walt* (1910), *Rippling Rhymes* (1913), *Horse Sense* (1915), *Terse Verse* (1917) and other volumes. He died at La Jolla, Calif., on June 22.

Masonic Order. Two features of this institution which have attracted the attention of educated men are illustrated by events of 1939. (1) *Antiquity*.—*Ars Quatuor Coronatorum* (XLIX, 4), organ of the celebrated Quatuor Coronati Lodge (of Research) No. 2076, London, published a paper read before that body by H. C. De La Fontaine on "The Portuguese Order of Christ" which is there shown as a survival of the ancient Knights Templar, organized at Jerusalem in 1118, flourished for nearly two centuries but was finally suppressed in France, where its Grand Master, Jacques de Molay, was burned in 1314. Four years later it was revived in Portugal by King Diniz, with the Pope's permission, and continued under a Grand Master, chosen by him, and a new name. Undergoing various changes, but preserving its identity, through the centuries, it became in 1789 a secular order, affording a model for branches which arose in both France and Britain. From the latter, the Templar degree was transplanted to America and was conferred in a Boston Masonic lodge during the 18th century. The Grand Priory of England and Wales, and the Grand Encampment of Knights Templar of the United States (organized 1816) are memorials of this long chapter of Masonic history.

(2) *Universality*.—"Masonry is known and practiced in every country and clime and by every race of civilized men," declared René Raymond, Grand Commander of the French Supreme Council, before the Algiers lodges on March 12. And this is still true despite its persistent suppression in most of the "totalitarian" countries. Its greatest growth has been in the United States where the latest available figures disclose 15,630 lodges with 2,521,651 members. Canada has 1,380 lodges with nearly 173,000 members; Australia, 162,031; New Zealand, 25,788. But it was in England, the *nidus* of modern Masonry, that its universality was best exemplified in 1939. Its "United Grand Lodge" (founded in 1717) is not only the premier one of the world; it is also the most widespread in its constituencies. Nearly 5,000 lodges, averaging about 80 members each, are scattered over the globe, owing direct allegiance to this mother grand body. Moreover, the present reigning House, ever since its accession in 1714, has been a patron of Masonry and, except for an interval of 30 years, has furnished an occupant of the Grand Master's throne for more than a century and a half. During the last 38 years, the incumbent has been the Duke of Connaught, brother of the late Edward VII, while the Pro-Grand Master, upon whom the active duties of the office devolve, is the Earl of Harewood, husband of Princess Mary, George VI's only sister. The King, who before his coronation, was Grand Master of Scotch Masons, acted as installing officer of his brother, Duke of Kent (at an "Especial Meeting" of this premier Grand Lodge) as Grand Master of English Masons throughout the world. The "Meeting," held in the new Freemasons Hall and the Olympia Stadium in London, lasted from July 18 to 21, 1939, and the ceremonies were on a scale befitting the participation of royalty. Representatives were present from the other British, and from 18 American Grand Lodges, besides distinguished individual Masons from many countries, and the whole affair, following so closely upon the King's North American tour, took on a highly

international aspect.

Another event which was awaited by Scottish Rite Masons as exemplifying the universality of the order, was the 8th International Conference of Supreme Councils, scheduled to meet at Boston on September 23 with the Northern (U.S.) Supreme Council as the host. Unfortunately no Supreme Councils outside the western hemisphere were represented but four therein (Canada, Cuba, Panama and Peru) sent a member representative. Only three sessions were held before adjournment, on September 29 and none of the matters presented to the conference was acted upon.

(C. S. L.)

Massachusetts, one of the thirteen original States of the United States, popularly known as the "Bay State"; area, 8,266 sq.mi.; population according to U.S. census of 1935, 4,350,910, estimated by U.S. Census Bureau, July 1, 1937, 4,426,000, estimated Jan. 1, 1938, 4,435,000; capital, Boston, population according to U.S. census of 1935, 817,713, estimated Jan. 1, 1938, 810,000. Of the State's population (1930) 1,913,418 or 45% live in the cities; 4,192,926 whites, 52,365 coloured; native born, 3,194,978; foreign born, 1,054,636.

History.—The Republicans, led by Governor Leverett Saltonstall, completed in 1939 their first year in control of the executive department of the State after six years of Democratic rule. Inaugurated in Jan. 1939, for a two-year term, were the following elective officers of the Commonwealth: governor, Leverett Saltonstall (R.); lieutenant-governor, Horace T. Cahill (R.); secretary, Frederic W. Cook (R.); treasurer, William E. Hurley (R.); attorney-general, Paul D. Dever (D.); auditor, Russell A. Wood (R.). The legislature, also elected for two years (though it now meets biennially and will not convene in 1940), consists of a Senate of 40 members, 28 Republicans and 12 Democrats, and a House of 240 members, 143 Republicans and 97 Democrats. By the end of the session, death and resignation had reduced this number to 142 Republicans and 96 Democrats.

The 1939 legislative session, the 151st in the history of the State, convened on Jan. 4, 1939, and was prorogued on Aug. 12. It sat for seven months and eight days—the third longest session in the State's history. During the session 517 acts and 74 resolves which had passed the General Court (as the legislature is termed in Massachusetts) received also the approval of the governor. Twenty-two acts and one resolve were returned by the governor without his approval, and in each case his veto was sustained. One act was allowed to become law without his signature. The principal battle of the session was over the taxation program proposed by the governor, a large portion of which finally passed. Near the end of the session the battle became so intense that the General Court set a new record by sitting continuously for more than 35 hours before prorogation. The governor also succeeded in reorganizing several State departments through removals, forced resignations and legislation.

As an aftermath of the severe hurricane of Sept. 1938, investigation into expenditures approved by several State departments resulted in the removal of James G. Reardon, commissioner of education, and William F. Callahan, public works commissioner, and in severe official criticism of State Conservation Commissioner Ernest J. Dean. In each case it was charged that expenditures were approved which were not covered by the State's special appropriation act and in some instances were not even of emergency nature. In other respects the State had fairly well recovered by Jan. 1, 1940 from the damage inflicted by the hurricane.

Education.—According to the latest available statistics from the department of education (June 1939) the public day schools of Massachusetts have an enrolment of 717,365, with an average daily attendance of 640,121. This represents a slight decrease

from the previous year. In addition, there were 30,750 pupils in the public evening schools and 909 in the public vacation schools. The total amount of money expended for the support of the public schools was \$70,198,883.23, of which \$50,506,174.78 was devoted to salaries and \$776,503.13 to textbooks.

Under the law education is free. It is compulsory for all between the ages of 7 and 14 years and required up to 16 years unless the sixth-grade work is completed. Massachusetts maintains a State college at Amherst, a State nautical school, a school of art in Boston, three textile schools and teachers' colleges at Bridgewater, Fitchburg, Framingham, Hyannis, Lowell, North Adams, Salem, Westfield and Worcester. In addition it supports a division of university extension, and a division of vocational education. It also awards State scholarships to deserving students who are children of World War veterans in several private colleges and universities. In the year ending Nov. 30, 1938, the State teachers' colleges had an enrolment of 2,470 women and 563 men. The number of people registered for university extension courses was 37,500.

Massachusetts also contains many important private institutions of higher education, among them Harvard, the oldest university in North America, Amherst, Williams, Massachusetts Institute of Technology, Clark, Boston college, Holy Cross, Boston university, Tufts, and Northeastern. Institutions for women include Mount Holyoke, Radcliffe, Simmons, Smith, Wellesley, and Wheaton colleges.

Charities and Correction.—Supervision of the State institutions is divided among several departments. The commission of Correction has charge of the State prison at Charlestown, the Massachusetts reformatory at Concord, the Reformatory for Women at Framingham, the State farm at Bridgewater and the Norfolk prison colony at Norfolk.

Under the jurisdiction of the department of Mental Health are State hospitals at Boston, Worcester, Taunton, Northampton, Danvers, Westborough, Medfield, Monson, Gardner, Waltham, Wrentham, Foxborough, Grafton, and Norfolk, as well as the Boston Psychiatric hospital, the Belchertown State school, and the Hospital Cottages for Children at Baldwinville. The department of Public Health supervises sanatoriums at Rutland, North Reading, Lakeville, and Westfield and the Hospital for Cancer Patients at Pondville.

Banking and Finance.—The State commissioner of Banks had under his supervision as of Oct. 31, 1939, a total of 881 banking institutions, including 192 savings banks, 72 trust companies, 184 co-operative banks, and 402 credit unions, and a few private banks. On that date these institutions had assets aggregating \$4,690,005,000. According to the commission of Administration and Finance, the State's net direct debt at the end of 1939 stood at \$31,366,090.13. This represents a decrease of \$9,318,994.23 during the year. The leading sources of revenue were motor vehicle licences and gasoline taxes, \$27,672,155.71; Federal grants, \$23,310,000.74; corporation and miscellaneous taxes, \$11,299,165.76; assessments on cities and towns, \$18,000,000. Total receipts for the year (including refunds of \$22,882 and transfers of \$245,000) \$113,356,468.45. Total expenditures, \$131,571,492.03. The General Court imposed new taxes of \$23,000,000 on cigarettes, liquor, dog-racing, inheritances and income surtaxes. The new taxes failed to balance the budget and left about \$18,000,000 in 1939, \$16,000,000 in 1940, to be levied from cities and towns in order to make up the deficit. These assessments are in part offset by a grant of \$9,600,000 each year to municipalities for highway improvement.

Agriculture, Manufactures, Mineral Production.—During 1939, according to the statistics of the United States Department of Agriculture, the State raised: 9,920,000lb. of tobacco, 465,000

bu. of cranberries, 280,000bu. of grain corn, 262,000 tons of silage corn, 2,420,000bu. of apples, 512,000 tons of hay and 231,000bu. of oats. Total crop acreage for 1939 is estimated at 490,650ac., an increase of 5,600ac. from 1938. The production of milk in 1938 totalled 801,000,000lb. and on its farms were 137,000 milk cows, 103,000 hogs, and 8,000 sheep, which gave 44,000lb. of wool in 1939.

With respect to manufactured goods, statistics for 1938 show the value of the State's leading products as follows: boots and shoes, rubber, \$16,658,838; boots and shoes, other than rubber, \$132,964,607; paper boxes, \$24,735,850; bread, \$79,255,214; women's clothing, \$43,987,205; cotton goods, \$66,988,947; dyeing and finishing textiles, \$47,900,883; electrical supplies, \$92,260,000; foundry and machine-shop products, \$63,703,683; leather, \$48,668,597; paper, \$55,447,418; printing, \$83,046,915; rubber goods, \$48,351,026; total, \$2,054,865,331. The number of industrial establishments in the State at the end of 1938 was 8,570, and the average number of wage-earners employed, 425,157.

Fishing is still one of the State's leading industries. In 1936 about 330,000,000lb. of fish, valued at \$9,000,000 entered the ports of Boston and Gloucester and were distributed therefrom.

The chief mineral products and their 1936 values were: coke, \$6,048,544; clay, \$953,655; lime, \$1,193,429; sand and gravel, \$831,103; and stone, \$3,204,858.

(A. M. S.)

Massachusetts Institute of Technology.

Notable among the institute's educational activities during 1939 were the increase in services to governmental agencies and other public bodies, and the growth of co-operative research between departments within the institute and between the institute and outside agencies. These activities have been directed toward improved health or safety, toward new or improved products and processes for industry, toward assistance of both business and Government in problems of personnel or planning, and toward national defence.

Altogether over 500 research projects were under way in institute laboratories. The institute's operating budget for the year 1938-39 totalled \$3,208,400; the gifts received totalled \$1,362,300; its educational plant assets passed the \$16,000,000 mark; and the book value of its endowment funds increased \$660,000 to \$36,230,000.

Enrolment for the academic year 1939-40 totals 3,100 of which 721 are graduate students, the largest number in the history of the institute. The extent to which the institute has become a national and international institution is indicated by the geographical distribution of institute students in 1939. Seventy per cent came from outside Massachusetts, 60% from outside New England, 33% from outside the North Atlantic States, and 7% from outside the United States. The number of foreign students registered, 231, represented 43 foreign countries. Of the graduate students registered in 1939, less than 25% received their Bachelor's degree from the institute, and altogether 220 colleges were represented.

Changes in personnel included the appointment of Walter R. MacCormack as dean of architecture replacing William Emerson, retired; Robert G. Caldwell, until recently U.S. Minister to Bolivia, as dean of humanities; Antoine M. Gaudin as Richards Professor of mineral dressing; and Sverre Pettersen as associate professor of meteorology.

New members elected to the Corporation during 1939 included two life members, Vannevar Bush and William Emerson; three alumni term members, Charles Edison, Philip W. Moore, Harold B. Richmond; and one special term member, Charles R. Hook.

(K. T. C.)

Mathematics. The founding, under the auspices of the American Mathematical Society, of a new international journal, *Mathematical Reviews*, to abstract and review current mathematical literature was an outstanding event in mathematics during 1939. The new monthly is sponsored by the American Mathematical Society, the Mathematical Association of America, and other organizations; grants from the Carnegie Corporation and the Rockefeller Foundation assure its publication for at least five years. *Mathematical Reviews*, the first number of which appeared late in December, is noteworthy for two important innovations: a low subscription price, which will ensure a wide circulation; a microfilm and photoprint service which will enable any subscriber, for a nominal charge, to obtain a microfilm or photoprint copy of any article reviewed.

The war in Europe dealt heavy blows to mathematics. There was the inevitable diversion of energies normally devoted to research in mathematics, but the subject and its scholars suffered also the actual horrors of war. The partition of Poland, whose mathematics had achieved a position of the highest eminence, resulted in the destruction of scholars, universities, and publications. The extent of the loss is not yet known. In the United States elaborate plans and arrangements had been completed for an International Congress of Mathematicians to be held in Cambridge, Mass. in Sept. 1940; the outbreak of war caused its indefinite postponement.

Although investigations in mathematics continue in all parts of the world, the year 1939 brought additional evidence of the importance of America in this field. About 500 research papers were presented at meetings of the American Mathematical Society. The expanding publication program, however, was especially significant. *Mathematical Reviews* has been mentioned already; the first two volumes of the new *Princeton Mathematical Series* were published in 1939. In addition, the University of Toronto announced the first two volumes of a new series to be known as *Mathematical Expositions*.

New results were obtained in every branch of mathematics in 1939. Investigations in algebra, which have been pursued with great vigour in Germany and America, were continued. Numerous papers on the theory of lattices and on applications of that theory to the theory of groups were published. *The Classical Groups*, by Weyl, and *Topological Groups*, by Pontrjagin (translated from the Russian by Emma Lehmer), were published as the first two volumes of the new *Princeton Mathematical Series*. *Structure of Algebras*, by Albert, and *Orthogonal Polynomials* (in the field of analysis), by Szegő, appeared in the *American Mathematical Society Colloquium Publications* series.

A revival of interest in algebraic geometry has occurred in the last 15 years as a result of the introduction of new methods—methods which are purely algebraic in character. A paper by Zariski entitled *The Reduction of the Singularities of an Algebraic Surface* is of prime importance. Other important papers were contributed by MacLane, Muhly, and Schilling; important books, by Conforto and van der Waerden.

Topology, the newest branch of geometry, maintained in 1939 its position as one of the leading fields of research in mathematics. A new book by Newman, *Elements of the Topology of Plane Sets of Points*, is a valuable addition to the literature.

In the field of analysis, investigations devoted to the Problem of Plateau and the related problem of conformal mapping occupied an important position. Significant contributions were contained in papers published by Douglas, Courant, and Morse and Tompkins. The papers of the latter two authors employ methods developed by Morse in *Functional Topology and Abstract Variational Theory*.

Research in probability and statistics continues unabated; their

applications are of the greatest importance in the other sciences—physical, biological, and social. A recent book, *Mathematical Biophysics*, by Rashevsky, is significant in beginning the application of mathematical methods to biology. This attack on its problems holds great promise not only for biology but also for mathematics. There is no doubt that the history of mathematical physics will repeat itself: from biology there will flow ideas destined to enrich the science of pure mathematics.

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Matter, Structure of. During 1939 there were several notable contributions to our knowledge of the constitution of matter. Most of these have been in the field of atomic physics and have dealt particularly with the structure of the nuclei of atoms.

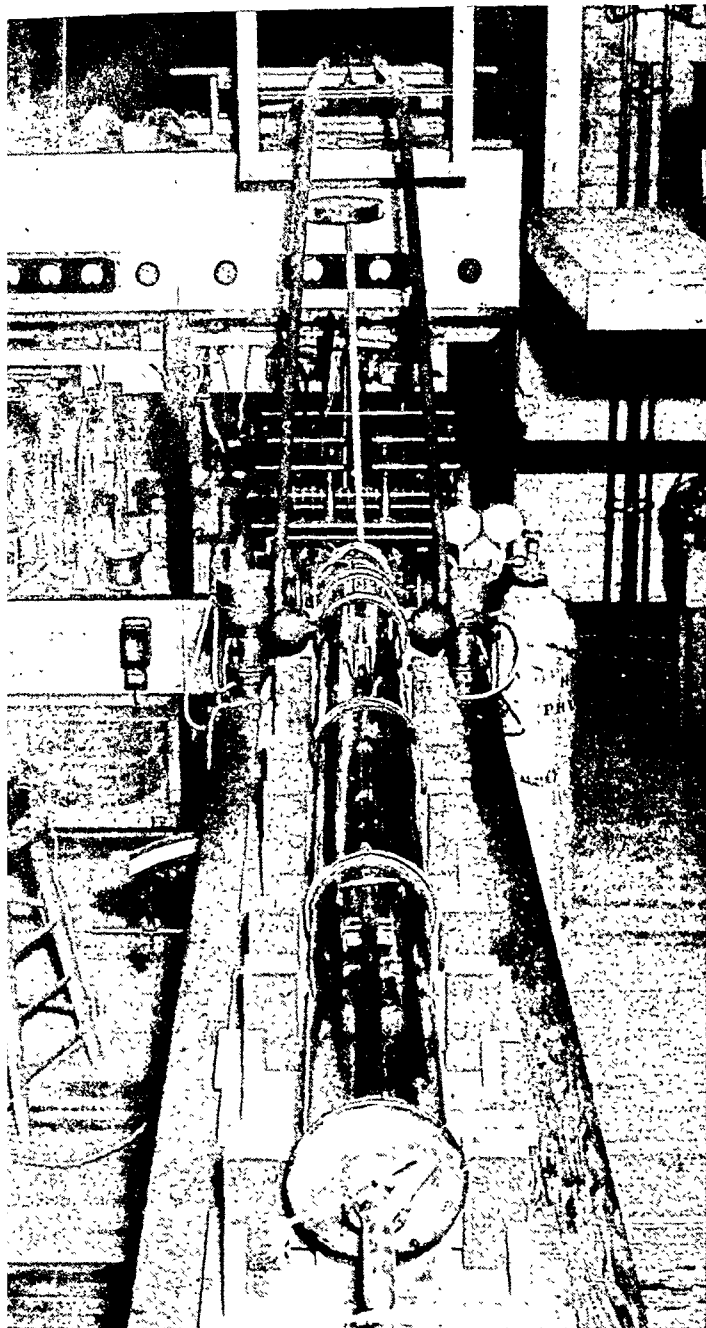
First, as regards the fundamental physical entities, the evidence for the existence of the mesotron has increased during 1939. This particle, which is now thought to constitute the very penetrating part of the cosmic rays, has a mass intermediate between that of the electron and proton, and appears with both positive and negative charge. Most likely it is formed at very high altitudes in the atmosphere from incoming gamma rays, and is probably unstable with a lifetime of a few millionths of a second. Direct experiments with a second fundamental entity, the neutron, have shown that it behaves as a small magnet; its magnetic moment was measured for the first time.

During 1939 several new radioactive forms of the elements (isotopes) were found, but experiments in this field were directed primarily to the study of the properties of the many unstable isotopes (roughly 300) already known. Their lifetimes and the energy of the particles emitted during their transformations have been measured. A possible sequence of transformations of these unstable isotopes was found in which four protons are absorbed and finally a helium atom formed. This formed the basis for the first adequate explanation of the heat of the sun and other stars. The phenomenon of nuclear "isomerism" was found to be much more general than was previously suspected. Probably as many as 30 pairs of unstable nuclei are known that are identical in nuclear charge and mass and yet disintegrate in different manners. One unstable isotope was discovered during 1939 that deserves special notice—a heavy hydrogen nucleus with three times the mass of proton. This hydrogen is radioactive with a half life of approximately 230 days. Heavy hydrogen (deuterium) with twice the weight of ordinary hydrogen was discovered in 1932 and the new unstable isotope is formed in a gas discharge under the violent impact of two deuterium nuclei.

A stable isotope of helium with an atomic weight of three was also discovered; it occurs mixed with ordinary atmospheric helium of mass four in the ratio of about one part to 10,000,000. A promising method for partially separating isotopes was developed during 1939 based on the phenomenon of thermal diffusion. (See also ISOTOPES, SEPARATION OF.)

The most important discovery during 1939 was that of the "fission" or splitting up of the heavy elements—uranium, protactinium, and thorium—into two elements in the middle of the table. This division occurs as a result of the absorption of neutrons. In 1934 the absorption of neutrons by uranium had been observed to give rise to a group of radioactive elements. These were supposed at that time to be new "transuranium" elements, with masses and atomic numbers greater than those of the known elements, and further experiments identified as many as 12 such elements with different rates of disintegration.

It was a great surprise when in Jan. 1939, O. Hahn announced that one of these supposedly transuranium elements was really



NEW TYPE OF ATOM-SMASHER with 8ft. glass tube, perfected in Jan. 1939 at Cornell university by Prof. Lloyd P. Smith

barium, and suggested that a new type of radioactivity might exist wherein the unstable nucleus, formed by the addition of a neutron to a uranium nucleus, instead of ejecting one of its nuclear constituents, may divide into two particles of comparable mass. This "fission" of a heavy nucleus should theoretically have several consequences. First the two particles should fly apart with great energy. This was soon verified, the particles were found to recoil from a uranium surface, to give intense pulses of ionization, and to produce heavy drop tracks, the energy set free agreeing with that calculated from the change of mass according to Einstein's relation.

A second consequence was that the new elements formed in the middle of the periodic table should be far too heavy for stability. They must either eject neutrons or change into elements with a greater nuclear charge. Experiments showed that both processes take place. Thus as a result of the fission process we find two mixtures of radioactive elements, a light group in which various observers have identified radioactive forms of krypton, rubidium, strontium, yttrium, and molybdenum, and a heavy group including radioactive isotopes of antimony, tellurium, iodine, xenon, caesium,

and barium. Several of these have already been shown to be elements formerly considered trans-uranium elements. How many of the trans-uranium elements really are known elements is still uncertain, but at least one of the atomic charge 93 and mass 239 seems likely to remain. As far as experiments have gone, the same fission products are obtained from thorium and protactinium as from uranium.

The fact that in the process of fission neutrons are produced, which in their turn might cause fresh fission processes in other atoms has suggested that a self-sustaining disintegration of uranium might occur.

Such a process would have a tremendous technical significance, as the energy set free in the fission of the uranium atoms in one pound of uranium oxide amounts to the extraordinary total of approximately 8,000,000 kwh. hours. However, the few experiments that have been made in this connection have not given any support to the idea that a self sustaining fission process is possible. (See also PHYSICS.)

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Maurice and Laura Falk Foundation, The: see FALK FOUNDATION, THE MAURICE AND LAURA.

Mauritania: see FRENCH COLONIAL EMPIRE.

Mauritius: see BRITISH EAST AFRICA.

Max, Adolphe (1869-1939), burgomaster of Brussels, achieved a world-wide fame in 1914-18 for his defiance of the German army of occupation in Belgium. He was born on December 31 and studied at Brussels university, where he was awarded his law degree at the early age of 20. For nine years he was provincial councillor for Brabant and in 1903 was elected a city councillor of Brussels. Later he became managing editor of *Le Soir* in the Belgian capital, and he was elected burgomaster of Brussels in 1909, retaining this office until his death. For his utter lack of respect for the German army chiefs he was imprisoned in 1914 and not released until Nov. 1918, despite appeals on his behalf from prominent personages of many nations. He died at Brussels on November 6 and was buried with national honours.

Mayo, Charles Horace (1865-1939), American surgeon, was born in Rochester, Minn., on July 19, the second son of Dr. William Worrall Mayo (1819-1911). He was educated at Rochester High school and a private academy, then went to Chicago, where he studied surgery under Dr. Christian Fenger, Dr. Nathan Smith Davis, and other famous surgeons of the day. He received his medical degree from Northwestern university in 1888 and later took post-graduate work in New York city. While he was still a student, a cyclone struck Rochester and killed 22 persons. His father was placed in charge of the 300 injured and was ably assisted in his work by Charles and his elder brother William (q.v.), though Charles had no formal medical training at that time. After this disaster the town recognized the need for a hospital, which was duly built and dedicated six years later. St. Mary's hospital was the nucleus of the famous Mayo clinic, established in Oct. 1889 by the father and his two sons, but not formally organized by the brothers until 1912. By this time the clinic was admitting thousands of patients annually and was already known as one of the world's greatest medical centres, a model of treatment not only for general diseases and operations, but for maladies that defied diagnosis. In 1938, the year before Dr. Charles Mayo's death, the clinic admitted its 1,000,000th patient.

Dr. Charles Mayo's versatility extended to practically all fields of medical knowledge, and his associates declared that he had performed every conceivable type of operation before his retirement in 1929. He is best known, however, as the originator of modern goitre surgery, concerning which he first published a paper in 1904. Almost equally famous was his surgical treatment of the nervous system. He originated a technique for operating upon varicose veins, performed more than 700 operations for cataract of the eye, and contributed much to surgery of the brain, ear, nose, throat, and abdomen. Focal infection and preventive medicine also occupied his attention.

In 1913 he was appointed first lieutenant in the Medical Reserve Corps of the U.S. Army and was later advanced to colonel. Alternating every six months with his brother, he was chief consultant for all surgical services in the Office of the Surgeon General from 1917 to 1919. He was appointed brigadier general in the Medical department of the U.S. Army in 1926. He was president of the American College of Surgeons in 1924-25 and of the American Medical Association in 1916-17. He wore the Distinguished Service medal and was an officer of the Legion of Honour. His recognitions from other countries almost outnumbered those bestowed upon him by his own. He died in Chicago on May 26 after an attack of lobar pneumonia and was buried in Rochester. See also *Encyclopædia Britannica*, vol. 15, p. 124.

Mayo, William James (1861-1939), U.S. surgeon, was born at Le Sueur, Minn. on June 29, and was educated at Rochester (Minn.) high school, Niles academy, and the University of Michigan, where he received his medical degree in 1883. For an account of the association with his father and younger brother in the famous Mayo clinic, see MAYO, CHARLES HORACE above; see also *Encyclopædia Britannica*, vol. 15, pp. 124-5. After his graduation from the University of Michigan's medical school, Dr. Mayo returned to Rochester to begin the practice of surgery and remained there except for brief periods until his death. He and his brother were known the world over for their eminent accomplishments in surgery; while Dr. Charles Mayo performed many varieties of operations Dr. William Mayo was perhaps best known for his surgery of the stomach. During the World War (1914-18) the two brothers alternated as chief consultants in the office of the U.S. Surgeon General. Dr. William Mayo was president of the American Medical Association (1905-06), the American Surgical Association (1913-14), the American College of Surgeons (1918-20), and the Congress of American Physicians and Surgeons (1925); his honorary degrees, decorations, and honours almost equalled in number those of his brother. He died at Rochester on July 28, two months after the death of Dr. Charles H. Mayo in Chicago.

Meat. About 500,000,000lb., or 5%, more meat was consumed in the U.S. in 1939 than in 1938, the Institute of American Meat Packers estimated. This is about 8% higher than the five-year (1929-33) average annual consumption. In the meat-packing year, which ends October 31, Federal-inspected meat totalled 11,390,000,000lb. in 1939 and 10,821,000,000lb. in 1938. Consumption for the year ending Oct. 31, 1940, is forecast at 12,200,000,000 pounds. Meat inspected by the Federal Government represents roughly about two-thirds of consumption. Increased meat production in 1939 was caused by the fact that the numbers of livestock on United States farms are rapidly filling up the reductions made by the droughts of 1934 and 1936 and the Government control program. The United States is the largest meat-producing country and meat animals provide about 25% of the farm income.

Prices of meat, especially pork products, rose sharply in the

U.S. during the first ten days of September, following the outbreak of war in Europe. By mid-November prices had gradually worked back to near their pre-war levels. The most marked effect of the war on the meat situation in the United States was the abrupt cessation of imports of canned hams from Central Europe, principally from Poland. A new item in meat imports was reported in 1939, dog food, of which 3,649,604lb. valued at \$109,145 was imported, chiefly from Argentina, in the nine months ending September 30. War had no effect on beef exports, but increased United States fresh pork and lard exports sharply.

U. S. Imports and Exports of Beef and Pork Products
(For first ten months of 1938 and 1939)

	Imports			Exports	
	1939 lb.	1938 lb.		1939 lb.	1938 lb.
Beef, fresh . . .	1,830,524	1,216,152	Beef & Veal, fresh	4,137,484	3,261,065
Veal, fresh . . .	125,595	78,193	Beef, cured . . .	5,477,079	4,968,391
Beef & Veal, . . .			Beef, canned . . .	1,200,606	1,523,002
pickled & cured	1,686,004	1,332,568	Pork, fresh & . . .		
Beef, canned . . .	69,647,546	58,400,564	frozen . . .	20,307,771	5,559,805
Pork, fresh . . .	1,622,343	3,443,364	Pork, Cumber- . . .		
Hams, Shoulders . . .			lands & Wilt- . . .		
& Bacon . . .	34,609,541	34,308,891	shires . . .	2,024,682	614,220
Pork, salt, cured . . .	2,075,039	3,058,584	Hams & Shoulders	49,662,914	40,411,509
& pickled . . .			Bacon . . .	7,511,581	6,440,342
			Pork, pickled . . .	10,665,784	9,782,349
			Pork, canned . . .	7,167,915	6,438,516
			Lard	213,557,320	148,324,925

Meat animals processed under Federal inspection the first ten months of 1939 were: cattle, 7,835,584 head; hogs, 31,694,605 head; sheep, 14,383,531 head. Cattle and calves imported into the United States the first nine months of 1939 numbered 604,015 head, as compared to 295,753 in the same period in 1938.

(S. O. R.)

Medical Association, American: see AMERICAN MEDICAL ASSOCIATION.

Medical Association, British: see BRITISH MEDICAL ASSOCIATION.

Medicine. Medical discoveries in 1939 centred principally on new developments in the fields of the vitamins, the glands and sulphanilamide with its derivatives. The year saw the lowest sickness and death rates ever achieved in the United States, including a tremendous lowering in maternal mortality.

Vitamins.—Most significant of the vitamin studies were those related to the use of vitamin B₁ in relationship to various forms of neuritis, some of these being classified as alcoholic neuritis, diabetic neuritis and metabolic neuritis, also in tics or habit spasms and some nervous disorders. The scientific name for this vitamin is thiamin chloride. It also influences appetite and digestion favourably. An adult requires about 300 to 350 international units, which is equivalent to about one milligram of pure thiamin per day. Pre-school children apparently require as much as 20 to 25 or more international units of this vitamin for every 100 calories of food that they eat. Whereas it was formerly thought that the foods which we eat contained plenty of vitamin B₁, we now know that our refined diet, and particularly the use of refined cereals, has produced a rather general shortage.

Vitamin B₁ is a water-soluble vitamin. Hence, when beans and peas are cooked in water, much of this vitamin is dissolved in the water. When the water is discarded, the vitamin B₁ is lost. There are only about ten foods which contain more than three micrograms of thiamin for each gram of food. These are principally potatoes, pork and liver, eggs, milk, fruits, beans and whole grain cereals.

A significant step has been the recognition of the possibility of reinforcement of white flour and other refined foods by the addition of thiamin. The vitamin also has significance in certain diseases of animals and of plants.

Other interest in the vitamins centred on vitamin K, which is useful particularly in forms of haemorrhage when there is a deficiency in the prothrombin of the blood. A new test for determining whether or not people need vitamin K has been developed during 1939. Babies born jaundiced or suffering from haemorrhage at birth sometimes have a deficiency of this vitamin. In such cases, preparations of vitamin K, derived from alfalfa, kale, spinach, carrot tops, tomatoes and oat sprouts, or made synthetically, can be given by mouth or injected directly into the body. This should be followed by an increased amount of prothrombin within three or four hours.

Interest in vitamins has also centred on vitamin B₆, which seems to be related to certain skin disorders. Moreover, much has been done with the vitamin concerned in pellagra known as B₂ or riboflavin.

Glands.—Most of the work on the glands during 1939 has been concentrated on the male and female sex hormones, which are now available in various forms, and which may be injected into the body, rubbed into the skin, or planted in pellets, for slow absorption, under the skin.

The male sex hormone, testosterone propionate, has now been shown to be of value particularly in persons who have lost the effects of these glands because of surgical operation, accident or disease. The use of this product has been especially important in men of the female type, in whom it will increase masculinity, produce a growth of beard and a deepening of the voice. Apparently, it is also effective in men who pass through a period resembling the climacteric in women, during which time there is a lessened secretion of the important male sex hormone. Apparently, also, the glandular material may be used in stimulating sex activity, although it is now established that the use of this material tends to inhibit the formation of the sperm or egg cell.

The female sex hormone known as estrogen has been found useful in many of the disorders associated with the climacteric in women, including not only the hot flashes and nervous reaction, but also the mental depression. Apparently also this material has been effective in some cases of leukoplakia, which is a thickening of the tongue, producing a condition which looks like a relief map, sometimes called geographic tongue.

Special studies made on the sex hormones indicate the possibility that they may have tissue-stimulating qualities, and that in persons in whom there is the history of cancer heredity, the glandular material must be used with the greatest of caution. Excess doses may be followed by enlargement of the breasts, and instances are reported of the possible development of cancer following large doses where there is susceptibility.

A synthetic substitute for oestrogen was announced as stilbestrol. This synthetic substance has all of the effects inherent in the glandular material itself.

Sulphanilamide and Sulphapyridine.—Extensive investigation made with sulphanilamide and sulphapyridine in a wide variety of diseases indicated that these drugs constitute one of the greatest medical discoveries of all time. Sulphanilamide has been shown to be of special value particularly in streptococcal infections and in certain forms of influenzal and streptococcal meningitis, which were formerly invariably fatal but now yield to the use of this remedy. It has been found especially valuable in trachoma, which is believed to be caused by a filtrable virus. Its use has been of the utmost importance in operations on the ears and the mastoid.

Sulphapyridine has been established as of special value in various forms of pneumonia, in some instances making the more expensive anti-pneumococcus serums unnecessary. Investigators in Boston and in Chicago found that there might be possible control for a formerly fatal condition, known as subacute bacterial endo-

carditis, in which they inject heparin, a new product developed in Canada, shown to have virtue in preventing coagulation of the blood and the formation of fibrin. After this material has been given to loosen up the vegetation on the heart valves, sulphapyridine was given to control the growth of the germs. Its effects were measurable as revealed by the response in lowering of the fever in the patients.

Studies with these remedies were of value also in smallpox, and in lymphogranuloma venereum. The tests in infantile paralysis and in tuberculosis were quite disappointing.

A new modification, sulphamethylthiazol, is believed to be especially useful for staphylococcal infections although this is not yet well established.

Metrazol Shock Therapy.—Continued work with shock therapy in dementia praecox indicated somewhat less promise in the insulin shock method, although considerable virtue still inheres in this form of treatment. Metrazol shock began to be used more extensively and was found to be of value also in certain depressional conditions affecting the mind, like manic-depressive insanity and involutional melancholia.

Surgery.—In the field of surgery, a new operative procedure which attracted attention was a technique developed by Lempert for persons with otosclerosis, in which a window is made directly into the internal ear, after which hearing is promptly restored. Unfortunately after a time, in many cases, there is a development of new tissue which invalidates the value of the operation. At present, investigators are working on modifications of the technique which will prevent this secondary complication.

Another interesting surgical procedure involves an operation for ductus arteriosus, a condition occurring at birth, in which an opening from the large veins into the aorta, so that the blood does not pass through the heart, is closed surgically. Lives have been saved by this new operative procedure.

A technique developed by Brien King involves a plastic operation to overcome paralysis of the vocal cords, caused by cutting or injury of the nerve in the operation on the thyroid gland. Successful results in a number of cases attracted interest throughout the world.

Continued studies made possible further transplantation to overcome scar tissue on the cornea of the eye with tissue removed from the eyes of babies who died at birth.

Another operation involved a technique employed on the sympathetic nervous system to control the pain in angina pectoris—a difficult surgical procedure employed only in the most serious cases.

Bacteriology.—Investigations in the field of bacteriology brought new knowledge concerning the virus which is responsible for the form of inflammation of the brain known as equine encephalomyelitis.

It was shown that the virus of infantile paralysis may be found in stools, and may in some instances enter the body by way of the gastro-intestinal tract.

An organism was isolated and studies were made in relationship to it as concerns the artificial infection of mice with a virus that will cause rheumatism.

Studies were also made on influenza as it occurs in swine, which indicate that swine influenza may be definitely related to human influenza, and that perhaps swine constitute the means by which epidemic influenza is kept alive between periods of epidemics.

A vitamin was discovered in the bacteria found in soil which seems to have the power of destroying gram-positive germs which bring about infections in human beings.

Studies made in the South indicate that rabies, formerly under control, is gradually increasing in certain portions of the South, affecting cattle particularly, as well as man.

Nervous System.—Most significant in studies on the nervous system were with metrazol shock method, already mentioned, and also the application of electroencephalography in determining new facts about the character of epilepsy.

Drug Therapy.—In the field of drug therapy, continued work showed the importance of prostigmine in the weakening disease of the muscles known as myasthenia gravis.

A form of epinephrine was developed known as slow epinephrine which may be put into the body and absorbed over a long period of time to produce more effective results in many forms of disease, particularly allergies in which epinephrine is advised.

In Dec. 1939, a new product for the treatment of syphilis which can be taken by mouth was announced by Stanford university, where Hanzlik and his associates have developed a preparation of bismuth known as sobisminol, with which excellent results have been achieved. This product has been tested in the clinics and been found to have merit, so that it has now been accepted by the Council on Pharmacy and Chemistry of the American Medical Association.

A concentrate of thrombin has been found useful in direct application for the control of haemorrhage.

In certain cases of allergic response to food substances with resulting headache, the taking of a preparation of histamine has seemed to be of value in desensitization.

A new anaesthetic called cyclopropane, previously developed, was finally standardized, and its uses definitely restricted. The new anaesthetic is an inhalation anaesthetic like ether, but serves better than ether in selected cases.

Basic Research.—Fundamental research of the greatest importance concerned the work on the causation of high blood pressure or hypertension by Goldblatt of Cleveland whose investigations demonstrated the importance of conditions which interfere with the action of the kidneys as a fundamental cause of high blood pressure.

A new biologic effect was observed by Temple Fay, Smith and their associates in Philadelphia, who tested the effects of long-continued freezing on cancer tissue. Apparently freezing inhibits cancer growth, although at the same time it stops all of the activities of the body, so that the human being is in a state of hibernation. The method has been tested thus far only on incurable cases; the results have not been conclusive. However, much is being learned of the nature of the cancer cell, and the method is believed to be of importance as a means of biologic study.

Medical Apparatus.—Also of interest in the study of cancer was the use of the cyclotron, which is the new atom-smashing apparatus developed in the University of California. Human beings were treated with neutron rays produced by this device, with the idea that the rays will break down the wild self-reproductive cancer cells and thus bring about a remission in cancer.

A new oxygen mask was developed by Boothby of the Mayo Clinic for treating patients with sea-sickness and for use by aeroplane pilots and others at high altitudes.

Miscellaneous.—Medical attention centred largely during 1939 on improvement in preservation of blood for use in blood banks. Reports became available suggesting the use of preserved serum and preserved ascitic or dropsy fluid as a substitute for blood.

Elman of St. Louis suggested the feeding of patients with severe degrees of malnutrition with a solution of amino acids which could be injected directly into the veins.

Observers report the possibility of using such materials as walrus tusks, soup bones, and antlers of deer for bone grafts.

Special attention was given to the possibility of control of some forms of hardness of hearing by the use of some of the sex hormones.

Continued studies were made, notably by Hart of Duke univer-



HUMAN HIBERNATION was described at the annual meeting of the American Medical Association in May 1939. Ice lowers body temperature to 89°, after which the patient sleeps for five days, with only a slow heart beat. This treatment apparently stops growth of cancer

sity, on the importance of sterilizing air in operating rooms with ultra-violet rays.

Attention began to be paid to psychosomatic medicine, that is to say, those forms of disease which are definitely related to mental factors, including such varying conditions as asthma, high blood pressure and arthritis.

Studies were also emphasized which relate to the effects of weather and of geography on health.

Health Legislation.—Especially important were considerations given by the Senate to the Wagner bill for making effective the National Health bill.

The new Food and Drug laws and the Wheeler-Lea bill to control advertising of foods, drugs, cosmetics and physical devices became effective. Widespread and important changes began to be made in labels and in advertising copy in response to these laws and their enforcement.

Refugee Physician.—The problems of the refugee physician coming from abroad to the United States were given special consideration by medical organizations, by the State licensing boards and by charitable organizations concerned with the care of the refugees.

Care of the Aged.—The problem of the care of the aged, both from a physical and an economic point of view, attracted increasing attention. It is recognized that the difficult diets of the aged tend to give them a lessened amount of minerals and vitamin D, and a lessened absorption of these products which affects the bones adversely. This may be associated with the bent or stooping attitude of the aged.

Motor Accidents.—Also important was the control of motor accidents with relationship to the physical condition and sobriety of the driver with standard plans for physical examination of those applying for driver's licence, the effects of a deficiency of vitamin A, and tests as to the amount of alcoholic intoxication prevailing in drivers of motor cars.

Nobel Prize in Medicine.—The Nobel prize in medicine was awarded to Domagk of Germany who is credited with having introduced the use of sulphanilamide.

Deaths.—Outstanding among deaths of physicians during 1939 was Dr. Harvey Cushing who won the Pulitzer prize for his *Life of Sir William Osler*, and is credited with having established surgery of the brain scientifically. Outstanding also were the deaths of the two famous Mayo brothers, Drs. William J. and Charles H.

Mayo, whose surgical accomplishments and organization ability made them recognized leaders in American medicine. (See also ALLERGY; ANAESTHESIA; BACTERIOLOGY; BIOCHEMISTRY; BIRTH CONTROL; CHEMISTRY, APPLIED; CHEMOTHERAPY; DIETETICS; DRUGS AND DRUG TRAFFIC; ENDOCRINOLOGY; EPIDEMICS AND PUBLIC HEALTH CONTROL; GYNAECOLOGY AND OBSTETRICS; HOSPITALS; PHYSIOLOGY; PSYCHIATRY; PUBLIC HEALTH SERVICES; RADIOLOGY; SERUM THERAPY; SOCIALIZED MEDICINE; STERILIZATION; SURGERY; UROLOGY; VETERINARY MEDICINE; VITAMINS; X-RAY. Also see articles on specific diseases.)

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Mediterranean, British Possessions in: see BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Memel Territory, a long strip of land along the right bank of the river Niemen on the frontier of East Prussia, comprises 976 sq.mi., and a population of about 150,000. According to the German census of 1910 this region had a population of 140,766, of whom 71,191 spoke German as their mother-tongue, 67,345 Lithuanian, and 1,970 were bi-lingual. The Germans greatly predominated in the town and port of Memel, the Lithuanians in the rural districts. By the Versailles Treaty Germany was compelled to cede the Memel Territory to the four principal Allied Powers.

While they were delaying as to its final disposition, the armed forces of Lithuania suddenly burst in and occupied it in January, 1923. The Powers accepted the situation but tried to regularize it by the Convention and Statute of May, 1924. Memel Territory was to be part of Lithuania but was promised large autonomy. Its Government was placed in the hands of a governor appointed by Lithuania; an elected chamber of representatives (*Landtag*); and a directorate of five.

Unfortunately racial hatred between Memellanders and Lithu-

anians prevented the smooth working of the Government. Lithuania tried to strengthen its hold on the territory by dismissing Germans from office, suppressing German newspapers, and expropriating German property owners to make place for Lithuanian farmers and business men. But these measures aroused great resentment and strengthened the German feeling. In 1935 Dr. Ernst Neumann and many other German Memellanders were accused of treason and condemned to long terms of imprisonment. Dr. Neumann, however, was released after a couple of years. He now created a unified German party with the slogan, "Back to the Reich." In the elections to the *Landtag* on Dec. 11, 1938, his party won a striking victory with 87.3% of the valid votes, while the Lithuanian tickets polled only 12.7%. Many persons expected that Hitler would use this electoral victory as a pretext for reuniting Memel with the Reich. Warned, however, by France and England to respect the Memel Statute of 1924, he did not do so until he had successfully annexed Bohemia-Moravia on March 15, 1939. Then he put pressure on Lithuania to cede the Memel Territory back to the Reich. Lithuania was too weak to resist, and on March 22, 1939, the Memel Territory was again a part of the Reich.

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Mendelsohn, Charles Jastrow (1880–1939), U.S. philologist and authority on codes, was born at Wilmington, N.C. on December 8. After graduating from the University of Pennsylvania and taking post-graduate work there, he began as a tutor in Greek and later became an instructor in history at the College of the City of New York. During the World War he was employed by the U.S. Government as a translator and censor. In 1918 he was commissioned captain of the military intelligence division of the U.S. general staff and placed in charge of deciphering German codes. After the war he continued his research in codes and the history of cryptography and wrote, in collaboration with H. O. Yardley, *Universal Trade Code* (1921). He died at New York city on September 27.

Mental Diseases: see PSYCHIATRY.

Menzies, Robert Gordon (1894–), Australian statesman, was born December 20 and was educated at Grenville college, Ballarat, at Wesley college, Melbourne, and at Melbourne university, where he graduated with highest honours. After practising for several years as a barrister at the Victorian bar he entered the Victorian parliament in 1928. During the next year he was a member of the legislative council of East Yarra, and from 1929 to 1934 he was a member of the legislative assembly of Nunawading. He was also (1932–34) attorney-general and minister for railways in the cabinet of Victorian Premier Argyle, and for a short time in 1934 was himself acting premier. In that year he was appointed attorney-general and minister for industry in the Australian cabinet of Joseph A. Lyons. Upon Lyons' death in 1939, Menzies was elected April 18 to succeed him as leader of the United Australia party, and two days later he received his commission to form a cabinet. Prime Minister Menzies announced in May that, as part of his foreign policy, he would seek better relationships with Japan. He also declared loyalty to the British foreign policy, and immediately upon the outbreak of war September 3 his cabinet approved a declaration of war against Germany. On September 15 he formed a war cabinet of six members, and on October 20 he announced the re-introduction of compulsory military training in Australia.

Mercer, Beryl (1882–1939), was born in Seville, Spain, the daughter of a diplomat and Beryl Montague

Mercer, well-known leading lady of the British Victorian theatre. She was educated at Guernsey college on Guernsey island and as a young girl became one of the most popular players of children's roles in Drury Lane productions. For a time she was under the direction of Sir Herbert Beerbohm Tree. She made her American debut at New York city in 1906 in *The Shulamite* and after a residence of three years in London returned again to the United States. In 1922 she went to Hollywood to act in motion pictures, but she returned frequently to the stage, notably in the Theatre Guild's productions of *Pygmalion* and *Right You Are if You Think You Are*. On the screen, as the "little old lady," she often personified eerie feminine characters with great effect. Among the pictures in which she appeared were *Three Live Ghosts* (1929 and 1936), *All Quiet on the Western Front* (1930), *The Little Minister* and *Jane Eyre* (1934), *Age of Indiscretion* (1935), *Magnificent Obsession* (1936), *Night Must Fall* and *Call It a Day* (1937) and *The Hound of the Baskervilles* (1939). She died at Hollywood, Calif. July 28.

Mercury. World production of mercury is estimated at 4,600 metric tons in 1937 and 5,200 tons in 1938, as compared with the record high of 5,610 tons in 1929. The leading producers are Italy, Spain and the United States; over the past 25 years, the distribution of the output has been one-third each from Italy and Spain (with Italy slightly in the lead), and one-sixth from the United States, the remainder being divided among a large number of minor producers, the chief of which are Mexico and the Soviet Union. The present distribution is not greatly different from this, except that Italy has taken a greater lead over Spain. Austria was formerly a producer on about the same scale as the United States, but in the readjustment of territory after the World War (1914-18) lost the producing district to Italy; without this addition to production capacity, Italy would rank below Spain, instead of above.

Italian production was 2,300 tons in 1938, but the rate declined somewhat in the first half of 1939. Spanish production has not been reported since 1935, but exports were about 1,400 tons in 1938. Sixty years ago the United States supplied two-thirds of the world total, but the highest figure in recent years was 860 tons in 1931, dropping to 330 tons in 1933, and increasing to 620 tons in 1938. United States imports in 1938 were only 81 tons, 47% from Italy, and 53% from Spain. British Empire production of mercury is limited to about 1 ton in Australia and New Zealand, but imports by the United Kingdom are heavy, the surplus of imports over re-exports in 1938 being 1,035 tons. German imports are still heavier, 1,132 tons in 1938. (G. A. Ro.)

Merit System: see CIVIL SERVICE.

Merrick, Leonard (1864-1939), British novelist and dramatist, was born Leonard Miller, February 21, and later changed his surname to Merrick. He was educated at Brighton college and at private schools. For a list of his works see *Encyclopædia Britannica*, vol. 15, p. 284. Merrick's novels never obtained a general popularity and he was known as a "novelist's novelist." In 1918 his books were reissued with introductions by some of the most famous authors of the day, including James M. Barrie, Arthur Pinero, Granville Barker, W. D. Howells and G. K. Chesterton. Merrick died at London on August 7.

Metallurgy. General features, equally applicable to various metals, that have occupied the attention of metallurgists during 1939 include fatigue, creep, age hardening, diffusion, and electrodeposition. Another phase is the wide-

spread attention that has been given to the so-called "powder metallurgy." Starting with the simple consolidation of pure metal powders by pressure and heat, this has now developed into a method of synthesizing a variety of alloys, both ferrous and nonferrous, from powders of the component metals.

Aluminium.—An interesting and potentially important new development is the use of a thin continuous strip of aluminium alloy as a base for motion picture film, which in use would operate by reflected light from the polished surface, rather than by transmitted light. The metal base has the advantages of faster processing, no stretching or shrinking, lower price, greater durability and strength, and the ability to use both sides of the film; furthermore, since the film is fireproof, the intensity of the illumination can be increased. A new bearing metal of aluminium, with 5.5-7% tin and smaller percentages of nickel, copper and magnesium, is reported to combine the desirable characteristics of white metal and copper-lead bearing alloys. (See also ALUMINIUM.)

Beryllium.—This metal received a great deal of publicity during the early months of 1939 through hearings of the Temporary National Economic Committee, which resulted in about 650 pages of published minutes, but apparently little else.

Copper.—A new smelter has been put into operation at Hurley, N.M., by Nevada Consolidated Copper Co., and plans are under way for another at Morenci, Ariz., by Phelps Dodge Corp. (See also COPPER.)

Iron and Steel.—There is a marked trend in the United States toward increased capacity in blast furnaces, up to 1,000 tons daily and more, as well as toward ore mixtures which will give a higher yield from the furnace. During the year the metallurgical department of the Jones and Laughlin plant at Pittsburgh announced the use of a battery of photo-electric cells with accessory apparatus to give precise control of the blowing of the bessemer converter by following the condition of the flame; this not only results in a more uniform product, but is also advancing knowledge of the oxidation process and of nitrogen absorption by the bath. This is the outstanding development of 1939 in steel metallurgy, as well as probably the most significant single step in the technology of bessemer steel since the discovery of the de-oxidation methods which made the process commercial, shortly after the invention of the process itself. (See IRON AND STEEL.)

Lead.—New features in 1939 are mainly the continued extension of former trends, rather than strictly new developments. Sintering machines have been increased in both length and width, and also separately in capacity without change of dimensions through careful control, especially of air leakage. A novel feature in blast furnace operation is being worked in a plant where a preponderance of gold and silver ores and a shortage of lead ores resulted in an insufficient lead fall for proper collection of the precious metals; this has been remedied by adding to the charge pig bullion, which is thus further enriched before going to the refinery. In refining, the process using gaseous chlorine has been extended to include the removal of tin. Several new alloys have been developed, including copper-tellurium-lead, tin-calcium-lead, and calcium-barium-lead. The addition of 2% magnesium to lead shot gives an alloy that completely disintegrates in contact with water in a few hours, and thus will serve to obviate lead poisoning in water fowl, caused from spent shot picked up from shallow water in feeding. (See also LEAD.)

Lithium.—A new source of comparatively large amounts of lithium (q.v.) has resulted from the by-product recovery of lithium salts from the potash operations at Searles Lake, California.

Manganese.—The electrolytic production of manganese (q.v.) has reached a stage where metal of 99.9% purity is being produced commercially.

Platinum.—Platinum-clad nickel sheets for use in chemical apparatus are now available in sizes up to four by eight feet.

Selenium and Tellurium.—A new development during 1939 is the use of selenium and tellurium in copper and copper alloys to improve the machineability of the product. Another new application is the use of selenium in a heavy-duty power rectifier which will withstand heavy overloads without deterioration.

Silver.—The addition of 0.25% silver to the standard 18-8 stainless steel is said to improve resistance to corrosion and pitting, to lessen the degree of work hardening, and to improve machineability; the new product has been made in castings, forgings, and sheets.

Using vaporization methods, silver coatings of the order of 0.00005 in. in thickness may be obtained; as a protective layer on an ordinary can the cost of silver would be only 0.05¢. Application of this protective layer to glass bottles has also been proposed, in order to protect the contents from the action of light, to reduce the effect of temperature through reflection of heat rays, and to retard the warming up of refrigerated materials, such as a beverage after being placed on the table. Silver has also been used in a magnesium alloy along with aluminium, zinc, and manganese, producing a high strength alloy with good corrosion resistance. Silver-tin alloys are also said to be receiving attention.

(See also SILVER.)

Tungsten, Tantalum and Molybdenum.—Efforts to reduce the consumption of tungsten in high-speed tool steels centre around the use of sintered carbides of tungsten and tantalum, and the substitution of part of the tungsten by molybdenum.

Zinc.—Work continues on the improvement in the yield from retort plants, one of which is now producing over 100 lb. of metal per retort daily. New extensions of plant capacity include a second unit of the New Jersey continuous retorts in Germany; a reflux plant, also in Europe; and extensions of plants for the electrogalvanizing of wire and sheets.

Continued technological improvements have been made in retort operation, recovery of volatilization losses from retorts, electrothermic distillation, and the recovery of cadmium, the latter serving the double purpose of increasing the output of cadmium and improving the purity of the zinc produced. (See also ZINC.)

(G. A. Ro.)

Metal Prices and Production: see MINERAL AND METAL PRICES AND PRODUCTION.

Meteorology.

The winter 1938-39 was characterized by abnormally high temperatures and above-normal precipitation in most sections of the United States although February was decidedly cold in central and western States. The season averaged above normal in warmth everywhere east of the Rocky Mountains.

Precipitation was much above normal in the eastern half of the United States and the Southwest, but was scanty in most Pacific sections. Snowfall was heavy in the northern Rocky Mountain States during the latter part of the winter.

Following the abundant winter precipitation, the spring months were generally warm and dry. Precipitation in March was scanty over a large northwestern area and April and May were decidedly dry throughout the Great Plains, so that by the middle of May

Monthly and Annual Rainfall, in Inches, 1939, in Cities of the United States

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	Annual Dept.
Albuquerque, N.M.	0.70	0.32	0.67	0.86	0.14	T	2.33	0.54	1.19	0.83	0.78	0.10	8.46	+ 0.49
Bismarck, N.D.	0.32	0.03	0.21	0.69	1.57	5.42	2.52	1.81	0.24	0.81	0.01	0.26	14.49	- 1.85
Buffalo, N.Y.	2.90	3.59	2.94	2.40	1.97	1.75	1.51	3.70	3.12	1.83	0.53	3.00	29.30	- 6.70
Charleston, S.C.	2.09	8.95	1.87	2.05	2.54	6.63	10.77	8.78	1.16	0.89	1.01	1.39	49.04	+ 3.82
Chicago, Ill.	2.22	1.98	0.96	3.22	3.66	5.13	2.74	1.47	0.40	1.79	0.95	0.90	27.51	- 3.77
Del Rio, Tex.	1.46	0.14	0.75	0.52	1.59	1.27	0.68	1.47	1.07	1.12	1.59	1.47	16.13	- 4.04
Helena, Mont.	0.20	0.70	0.47	0.56	1.59	2.63	0.44	0.48	0.80	1.24	0.05	0.34	9.59	- 10.28
Houston, Tex.	4.89	4.08	0.63	1.25	3.12	3.17	0.39	0.52	2.30	1.64	3.16	2.62	36.77	+ 0.23
Knoxville, Tenn.	3.82	10.09	5.04	5.00	1.03	4.83	8.37	2.12	0.94	0.38	2.21	3.18	47.61	- 3.17
Los Angeles, Calif.	2.96	1.13	1.44	0.22	0.02	T	T	0.01	5.67	0.13	0.08	0.38	12.06	+ 7.13
Memphis, Tenn.	9.72	10.07	5.14	7.34	4.51	4.05	3.46	2.23	2.31	0.94	2.18	2.90	54.85	+ 1.73
Miami, Fla.	0.51	0.38	1.32	1.19	8.01	2.20	10.25	6.81	4.56	14.42	3.62	3.22	57.39	- 5.10
Mobile, Ala.	2.64	7.44	2.11	2.58	8.52	9.12	7.02	8.81	4.81	0.13	0.69	2.55	56.42	- 5.10
New York, N.Y.	3.80	5.97	4.81	3.26	0.56	3.98	0.44	4.37	1.21	3.96	1.47	1.22	35.69	+ 11.55
Norfolk, Va.	3.93	5.52	4.00	3.26	1.53	6.51	12.40	9.20	0.56	5.04	3.14	1.15	55.64	- 6.46
North Platte, Neb.	0.70	0.15	0.88	1.26	2.51	3.51	0.35	1.17	0.20	0.56	T	0.64	11.03	- 3.65
Oklahoma City, Okla.	3.76	0.43	1.76	1.08	2.88	7.83	0.62	5.52	0.06	2.39	0.84	0.93	27.59	+ 0.65
Portland, Me.	3.19	3.52	8.00	5.70	1.52	2.08	5.94	2.87	1.62	3.34	0.56	4.16	42.59	- 10.87
Portland, Ore.	4.69	5.26	2.29	0.55	1.08	1.73	0.79	1.52	0.60	2.74	1.73	8.37	30.75	- 10.86
San Francisco, Calif.	3.07	1.94	2.62	0.42	0.63	T	T	T	1.06	0.17	0.20	1.05	11.16	+ 0.89
Sault Ste. Marie, Mich.	2.89	3.01	2.14	1.76	2.46	5.86	1.08	4.48	3.04	3.90	1.42	1.18	33.22	+ 0.89

T=Trace: less than 1/100 of an inch

Monthly and Annual Mean Temperature and Extremes in °F., 1939, in Cities of the United States

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	An. Dept.	High-est	Low-est
Albuquerque, N.M.	34.4	30.0	46.2	56.0	65.5	74.3	76.2	75.7	70.6	56.0	44.2	40.0	55.8	+0.5	101	- 6
Bismarck, N.D.	19.0	1.5	26.6	43.9	62.0	61.6	74.4	69.0	60.2	43.0	36.4	27.7	43.8	+2.8	100	-39
Buffalo, N.Y.	26.3	27.4	30.3	30.0	55.6	65.7	70.5	72.0	62.8	52.0	38.0	32.3	47.7	+0.7	91	- 1
Charleston, S.C.	52.8	57.8	61.5	66.0	72.3	81.8	81.8	80.2	79.2	69.4	58.0	51.4	67.4	+1.4	97	28
Chicago, Ill.	31.6	27.6	38.2	45.2	61.4	70.8	74.0	72.6	70.0	56.0	41.6	35.0	52.0	+2.0	100	3
Del Rio, Tex.	54.4	53.6	66.4	72.2	79.3	84.0	86.8	82.2	81.2	72.6	57.0	55.3	70.4	+2.8	108	29
Helena, Mont.	31.6	70.0	34.6	46.2	50.0	55.6	70.2	67.8	57.4	40.7	39.2	33.6	46.5	+3.2	95	-30
Houston, Tex.	57.1	50.8	64.6	68.7	76.8	81.8	83.8	83.8	81.0	72.4	58.8	59.0	70.4	+1.3	104	29
Knoxville, Tenn.	42.6	47.0	51.9	57.2	68.6	78.2	78.8	77.6	75.9	63.6	47.0	42.4	60.9	+2.5	99	16
Los Angeles, Calif.	57.0	54.0	56.8	63.0	66.9	70.6	73.0	76.6	71.6	67.1	64.2	65.4	63.0	+3.0	107	38
Memphis, Tenn.	40.9	45.2	50.0	59.2	70.8	79.2	81.8	80.2	80.1	66.6	49.8	46.6	63.5	+1.9	99	22
Miami, Fla.	68.8	73.2	74.0	75.6	77.4	80.8	82.0	81.7	81.7	79.6	70.8	67.8	76.1	+1.7	92	44
Mobile, Ala.	55.8	50.7	62.3	66.2	73.8	80.6	82.0	80.8	79.4	70.1	57.0	54.8	68.3	+1.0	98	29
New York, N.Y.	32.3	37.4	38.8	47.8	63.7	70.8	74.1	76.8	74.2	56.4	43.2	36.2	53.7	+1.4	92	21
Norfolk, Va.	45.2	49.8	52.4	58.8	67.8	77.2	77.3	79.2	74.8	64.3	50.0	44.4	61.8	+2.3	96	-10
North Platte, Neb.	32.6	23.6	49.2	65.2	69.6	79.6	73.4	68.8	53.0	40.0	35.0	52.6	42.3	+4.3	106	9
Oklahoma City, Okla.	45.0	37.4	54.2	60.2	72.1	78.4	84.7	81.7	60.2	47.2	40.6	46.3	62.4	+3.0	107	9
Portland, Me.	23.6	24.8	29.2	40.6	53.2	61.1	67.9	69.7	60.2	49.7	37.0	29.0	45.5	o	96	- 1
Portland, Ore.	43.8	40.8	49.4	56.0	60.6	61.3	69.4	70.0	66.4	56.6	50.0	46.4	55.8	+1.7	100	24
San Francisco, Calif.	52.0	51.2	52.8	55.8	57.0	57.8	60.0	60.6	66.4	63.0	59.2	55.3	57.5	+2.4	97	39
Sault Ste. Marie, Mich.	16.0	11.0	19.0	34.2	50.6	58.8	64.5	64.6	54.8	42.0	31.8	25.3	39.4	+0.2	93	-25

Duration of Sunshine, in Hours, 1939, in the United States

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	Annual Dept.
Albuquerque, N. M.	203	241	282	334	381	397	337	348	300	324	232	266	3645	+223
Bismarck, N.D.	130	206	287	276	333	269	397	322	224	149	210	125	2928	+266
Buffalo, N.Y.	70	122	188	168	346	309	396	348	210	172	132	79	2531	+196
Charleston, S.C.	227	181	269	298	275	256	329	253	210	236	213	210	2935	+ 26
Chicago, Ill.	86	160	241	211	348	313	358	338	302	233	159	130	2879	+228
Del Rio, Tex.	186	215	196	264	277	286	244	280	202	240	130	111	2873	+166
Helena, Mont.	136	160	253	257	330	254	376	335	254	162	108	118	2858	+101
Houston, Tex.	143	147	191	254	282	298	251	277	280	241	138	198	2773	+ 18
Knoxville, Tenn.	155	166	246	273	329	323	201	260	277	254	157	164	2902	+293
Los Angeles, Calif.	209	243	214	262	284	350	345	338	265	296	236	242	3284	+ 72
Memphis, Tenn.	144	116	183	192	220	204	337	291	275	233	127	134	2456	-322
Miami, Fla.	211	209	278	270	244	263	255	196	204	203	143	229	2705	-270
Mobile, Ala.	183	145	253	286.6	279	276	280	255	261	291	204	179	2891	+124
New York, N.Y.	130	157	214	248	308	259	258	206	240	174	183	128	2505	-188
Norfolk, Va.	181	163	222	273	323	298	262	323	229	210	172	169	2735	+ 23
North Platte, Neb.	158	202	272	241	319	318	332	276	292	266	221	162	3059	- 43
Oklahoma City, Okla.	192	184	270	310	352	341	410	350	342	307	191	236	3485	+493
Portland, Me.	198	144	205	231	297	284	331	280	220	162	207	156	2724	+131
Portland, Ore.	68	90	216	251	297	260	362	290	234	135	107	38	2357	+210
San Francisco, Calif.	169	222	178	284	311	373	312	280	270	294	242	127	3071	+133
Sault Ste. Marie, Mich.	72	116	161	204	251	262	337	248	184	88	72	79	2073	- 52

a rather severe drought had developed over a large midwestern section. Temperatures were abnormally high during the spring season.

The weather of summer was mostly favourable for agriculture. The spring drought that threatened to hold over into the summer was relieved by good, timely, and very beneficial rains the latter part of May and in June. Growing crops responded rapidly and developed satisfactorily in most of the principal agricultural areas. The summer was somewhat warmer than normal with only a few widely scattered areas having below normal temperature for the season as a whole.

The outstanding weather feature of 1939 was the severe fall drought. Following the mostly ample summer rainfall, a long, dry period set in the latter part of August and continued practically uninterruptedly until the close of the year. For the three fall months, September–November, only limited areas in the far Southwest and the middle Atlantic coast region had normal rainfall, with all other States having deficiencies. The relatively driest area extended from the central Mississippi Valley westward to the central Rocky Mountains. For the fall season Nebraska had only 26% of normal rainfall, and Kansas only 29%. It was the driest fall of record over large areas of the U.S., a long record at Minneapolis, Minn., showing the driest November in more than 100 years. The closing month of 1939 was remarkably warm everywhere until the last week when there was a reaction to abnormally low temperatures which carried subzero weather well into the Central valleys, and frost to the Gulf coast.

For 1939 as a whole the temperature for the United States averaged abnormally high, the means being remarkably similar to those for the preceding year. Practically all parts of the U.S. had a warmer than normal year, with the greatest abnormalities, about 4°, in the interior and central-northern portions of the Great Plains. The preceding year also was about 4° warmer than normal in these areas. The lowest temperature reported for the year was 51° below zero at Meadowlands, Minn., on February 21; the highest was 123° at Greenland's Ranch, Calif., on July 13. The record extremes for the United States are -66° and 134°, the former occurring in the Yellowstone National Park, and the latter in Death Valley, California.

Precipitation for 1939 as a whole was about normal east of the Mississippi river, and below normal practically everywhere to the westward. Alabama, with a State average of 59.33in., was the wettest State, and Nevada with 8.45in., the driest. Some central Rocky Mountain localities had the least annual rainfall of record. In general, there was considerably less precipitation in 1939 than in 1938.

Sunshine was above normal in most parts of the U.S., though

Monthly Rainfall in Inches for 1939, Outside the United States

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
London	4.3	0.8	1.0	2.2	1.4	1.2	1.8	3.4	0.9	4.9	4.4	..
Edinburgh	3.3	1.5	2.5	1.2	1.0	1.3	2.3	1.4	1.5	2.0	3.5	..
Paris	3.6	1.9	1.5	1.9	1.7	2.3	..	..	..	..	..	..
Berlin	2.2	0.8	3.0	1.3	2.2	2.2	3.1	..	..	..	..	..
Stockholm	2.2	1.0	0.5	1.7	0.3	1.1	3.8	0.8	2.2	1.0	..	..
Oslo	3.1	1.6	0.8	1.6	0.8	4.7	5.9	2.0	..	..	..	..
Copenhagen	3.4	1.1	0.9	1.8	1.1	1.3	2.3	2.1	0.6	1.5	..	..
Utrecht	3.8	1.2	2.5	2.6	2.3	1.0	4.2	2.2	3.7	4.2	..	..
Vienna	1.6	0.4	2.8	0.4	5.5	2.0	3.1	..	..	..	..	..
Rome	2.8	3.1	3.9	0.8	1.6	3.1	0.0	..	..	..	..	..
Calcutta	0.1	1.5	0.0	1.6	2.7	15.2	14.9	21.7	..	..	..	..
Bombay	0.0	0.0	0.0	0.0	0.0	4.7	33.1	10.9	..	..	..	..
Baghdad	1.4	1.1	0.8	..	0.0	0.0	0.0	..	..	..	..	..
Singapore	10.7	6.3	6.6	8.7	2.3	5.7	3.8	7.8	12.3	10.8	..	..
Cape Town	0.0	1.6	0.4	1.5	4.0	1.9	3.6	2.7	1.2	0.3	1.2	..
Johannesburg	3.7	7.3	2.7	0.3	1.7	0.0	2.4	1.2	0.7	3.0	8.3	..
Salisbury (Rhodesia)	9.5	16.8	11.8	0.6	0.6	0.2	0.1	..	..	..	..	..
Toronto	2.3	3.6	3.2	3.4	1.5	1.0	1.7	4.2	2.5	..	..	..
Winnipeg	0.8	1.5	0.1	1.1	1.4	2.5	1.4	5.5	1.6	..	..	..
Victoria, B.C.	4.7	3.5	1.2	0.4	1.6	1.2	1.2	0.3	0.3	..	..	..
Sydney	3.2	0.1	10.9	3.9	3.2	0.7	1.2	2.9	2.9	..	..	..
Melbourne	0.3	7.7	0.8	4.5	2.0	3.1	0.9	4.3	2.1	..	..	..
Perth	0.7	1.1	0.1	1.1	7.8	11.1	11.2	8.7	0.4	..	..	..
Wellington, N.Z.	0.9	0.7	1.1	3.0	2.3	3.4	6.0	5.9	2.9	2.8	..	..

Monthly Mean Temperatures in °F for 1939, Outside the United States

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
London	41.9	42.6	43.5	48.6	53.0	59.1	61.3	63.4	59.8	48.9	48.7	..
Edinburgh	37.5	41.9	41.8	44.6	51.4	56.7	57.9	59.5	56.0	46.1	44.7	..
Paris	44.1	41.4	43.2	52.3	55.4	55.2	..	..	..	..	..	..
Berlin	37.4	37.4	36.0	49.1	53.2	63.7	65.5	..	..	..	..	..
Stockholm	30.4	35.8	32.4	41.0	49.8	59.9	64.8	67.1	53.6	39.4	..	..
Oslo	25.0	30.9	32.4	41.0	51.1	59.4	61.0	64.0	..	..	..	..
Copenhagen	35.4	37.9	35.6	44.4	52.0	62.1	64.0	66.6	58.3	44.2	..	..
Utrecht	40.1	39.2	41.2	50.9	57.0	65.5	65.5	66.9	61.2	46.6	..	..
Vienna	34.3	37.8	36.5	54.9	55.8	64.4	68.0	..	..	..	..	..
Rome	51.1	47.7	46.0	55.2	58.8	63.5	70.9	..	..	..	..	..
Calcutta	69.4	74.9	81.6	89.1	88.7	86.5	83.0	83.1	..	..	..	..
Bombay	76.6	76.4	78.5	81.9	84.8	84.7	80.7	80.7	..	..	..	..
Baghdad	49.3	50.4	58.5	..	83.7	88.5	91.0	..	..	..	..	..
Singapore	79.6	80.1	80.9	81.5	81.8	81.1	81.7	80.9	79.0	80.1	..	..
Cape Town	71.3	70.5	68.9	62.9	61.9	60.1	57.8	56.6	60.4	63.7	67.4	..
Johannesburg	65.7	65.5	62.7	59.7	55.8	51.1	48.2	52.5	56.7	63.1	61.8	..
Salisbury (Rhodesia)	67.9	68.2	65.6	63.9	61.2	54.5	56.3	..	..	..	..	..
Toronto	23.7	24.8	28.7	40.6	57.9	65.5	71.8	72.3	61.7	..	..	..
Winnipeg	4.5	8.9	14.1	37.0	55.6	59.0	70.1	67.8	55.3	..	..	..
Victoria, B.C.	42.9	39.1	44.1	52.1	54.3	55.4	59.6	62.2	58.1	..	..	..
Sydney	72.3	74.1	69.7	66.1	61.7	56.5	51.9	57.1	58.5	..	..	..
Melbourne	70.0	69.1	65.7	61.0	57.2	51.2	47.3	51.0	54.7	..	..	..
Perth	69.7	75.1	72.5	66.8	60.8	56.9	55.2	55.9	59.5	..	..	..
Wellington, N.Z.	58.9	60.3	60.1	56.3	51.9	50.8	43.3	47.9	50.3	52.3	..	..

there was much more cloudy weather than normal in some areas, principally in the Central valleys and extreme Southeast. Many parts of the U.S. had from 100 to nearly 300 more hours of sunshine than is received in a normal year.

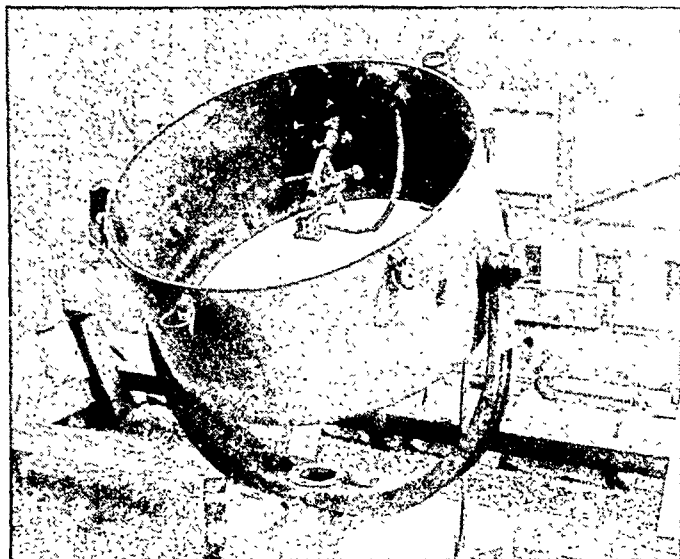
Storms, Floods, Etc.—While the number of tornadoes reported in 1939, 137, was near the average of 141 for the U.S. as a whole, most of the storms occurred in sparsely settled communities, making the loss of life and destruction of property less than in a normal year. While, on the average, tornadoes kill 265 people and destroy approximately \$12,000,000 worth of property annually, the loss of life in 1939 was only 97 and the property damage about half the average amount. The greatest loss of life for a single storm occurred at Center Point, Ark., and vicinity, on April 16, killing 27 people. (See also FLOODS AND FLOOD CONTROL.)

The general storm damage was also comparatively small. A tropical disturbance on September 24 and 25 in Los Angeles and vicinity resulted in the death of 45 people and damage to or destruction of property to the amount of some \$2,000,000. However, no tropical storm of consequence reached the south-eastern portion of the U.S. during the hurricane season of 1939.

(F. W. RR.)

Europe.—The values of monthly rainfalls and monthly mean temperatures in the tables are to be regarded as provisional, and subject to slight corrections. Blanks in the tables indicate that the corresponding data were not available (Jan. 1, 1940).

General Notes on the Weather of 1939. The north Atlantic was unusually stormy during January, and in consequence rainfall was above normal over a large part of northwest Europe. The first half of January was also one of the stormiest in recent years in the north Pacific. Stormy conditions over the north Atlantic



THE HEIGHT OF CLOUD CEILINGS can be measured in daytime by a new experimental detector with a photoelectric cell mounted at the focus of a reflector

persisted during the first half of February, and recurred in May. There was a long thundery spell over the British Isles in mid-July. At the end of December a severe earthquake in Turkey was followed by very heavy rainfall and severe flooding of many rivers, with heavy loss of life.

(D. BRU.)

Methodist Church. On May 10, 1939 at Kansas City, The Methodist Episcopal Church, The Methodist Episcopal Church, South, and The Methodist Protestant Church united to form The Methodist Church. The articles of religion of The Methodist Church are those which the three uniting churches have historically held in common.

The Methodist Church is organized into conferences. A General Conference for the entire church, meeting once in four years, has full legislative power over all matters affecting the total life of the church. It is composed of not less than 600 nor more than 800 delegates, ministerial and lay in equal numbers, elected by the Annual Conferences. The Annual Conference is itself composed of ministers and laymen, in equal numbers, representing the churches in a given area.

In the United States, there are jurisdictional conferences composed of delegates, ministerial and lay in equal numbers, elected by the annual conferences within their several boundaries. The jurisdictional conference meets within the 12 months succeeding the meeting of the General Conference. It elects its own bishops, promotes the evangelistic, educational, missionary, and benevolent interests of the church, and provides for interests and institutions within its boundary.

The church outside the United States is organized into central conferences that have powers and duties similar to those of the jurisdictional conference. A Council of Bishops composed of all the bishops of all the jurisdictional and central conferences meets at least once a year to plan for "the general oversight and promotion of the temporal and spiritual interests of the entire Church." At this meeting, the bishops of the central conferences may vote only on matters relating to their respective conferences. A bishop has residential and presidential supervision only in the jurisdiction that has elected him. On request of another jurisdiction, however, he may be transferred to that jurisdiction by the Council of Bishops.

In the Uniting Conference at Kansas City, the delegates from the Annual Conferences of the Methodist Protestant Church, which was non-episcopal, elected to the office of bishop two

ministers of their church who, being ordained at the conference, became effective bishops of The Methodist Church.

Women and youth have representation on nearly every board and commission of the church. The Board of Missions and Church Extension has general oversight over all the missionary enterprises of the church. It operates through four divisions: (a) division of foreign missions; (b) division of home missions and church extension; (c) Woman's division of Christian service; (d) joint division of education and cultivation.

Congregations of The Methodist Church, totalling 46,255, are now to be found in the United States, Cuba, Central America, Uruguay, Argentina, Chile, Bolivia, Peru, Austria, Belgium, Bulgaria, Czecho-Slovakia, Denmark, Estonia, Finland, Germany, Hungary, Italy, Yugoslavia, Latvia, Lithuania, Norway, Poland, Sweden, Switzerland, Union of South Africa, Portuguese East Africa, Southern Rhodesia, Angola, Belgian Congo, Liberia, Tunisia, Algeria, India, Burma, Sumatra, Sarawak (Borneo), Malaya, Philippine Islands and China. In Japan, Chosen, Manchuria, Brazil and Mexico there are autonomous Methodist Churches to whose support The Methodist Church contributes.

The membership of The Methodist Church is 7,856,060 (U.S. 7,492,935; other countries 363,125). Its Sunday schools, numbering 46,369, enroll 5,926,155 persons (U.S. 5,593,190; other countries 332,965). There are 65 bishops (effective and retired); 21,687 effective ministers and 15,969 local preachers; 2,000 deaconesses (U.S. 835; other countries 1,165); 5,592 home missionaries; 1,457 foreign missionaries (Asia 1,068; Africa 152; Latin America 225; Europe 12); 1,805 ordained native ministers and 16,500 unordained native workers. The 139 educational institutions of The Methodist Church enroll 93,000 students; its 83 hospitals, with 5,300 nurses, minister annually to 365,000 patients; its 115 "homes" care annually for 4,500 children, 3,200 aged persons, and 800 young people. It has, also, 40 homes for deaconesses.

The Methodist Church has property whose net value is \$656,474,867 (U.S. \$625,018,885; other countries \$31,455,982). It has permanent funds amounting to \$14,132,961.73; and annuity funds totalling \$7,313,458.06. Its current asking for foreign missions is \$3,980,504; for home missions, \$2,510,533. During a recent period of 12 months, it raised for ministerial support, debt payment, current expenses, general work, and benevolences a total of \$80,543,997. During this same period, it administered the rite of baptism to 309,949 persons and received 315,652 persons into full membership in the Church. A considerable portion of the funds of the American Church Committee for China Relief is now being administered across China by missionaries of The Methodist Church.

(E. F. T.)

Great Britain.—The annual conference of the Methodist Church met in Liverpool for a fortnight in July 1939, under the presidency of the Rev. Richard Pyke, a former president of the United Methodist Conference. The report of the National Children's Home and Orphanage showed that about £200,000 was raised in the year for this work.

The total number of full members of the Methodist Church in March 1939, was reported to the Liverpool conference as 802,455 (net decrease 2,177), with 18,338 "on trial," and 65,967 junior members. The number of lay preachers is 31,990. There are 980,005 scholars in the Sunday schools, but this figure represents a decrease of 23,795.

The report of the Overseas Missions issued in June 1939, shows an adult baptized Christian community of 223,487 recognized as full members of the church, an increase of 3,732 on the year. There are in addition 39,042 baptized adherents, and 189,826 on trial for full membership, and 220,227 children in the Sunday schools. The total Christian community under the care of the Methodist Missionary Society, in the West Indies, Ceylon, India,

Burma, China, Africa and Latin Europe is 752,406. All these figures show great increases, even if the home church has nothing comparable to report. The Missionary Society is without a debt. The total income raised for its work by the home church was £317,849, and by the churches on the mission fields, £116,029. The total income of the Missionary Society was £482,726.

BIBLIOGRAPHY.—The above figures from Methodist Conference *Minutes* (1939) and *Annual Report* of the Methodist Missionary Society for 1938, issued June 1939. (J. R. J.)

Metropolitan Museum of Art: see ART EXHIBITIONS.

Mexico, a Federal republic, between the United States and Central America and bordering the Pacific and Atlantic (Gulf of Mexico); language, Spanish; capital, Mexico City; president, Lázaro Cárdenas; area, 767,168 square miles. Population (census, 1930) 16,552,722; (official estimate, 1935) 18,512,837. In 1930 approximately 55% of the population was mestizo, 29% Indian, and 15% white, with less than 1% (150,000) foreign. Approximately 14% of the total population speaks only Indian tongues. There are some Negro and part Negro elements on the Gulf of Mexico coast. The chief cities are: Mexico City, 1,029,068; Guadalajara, 184,826; Monterrey, 137,388; Puebla, 122,914; Mérida, 110,183.

History.—Mexico includes 28 States, each with its own governor and legislature and a limited autonomy, and three territories and a Federal district, with governors appointed by the president. The national Government is administered by a president elected for six years, and a bicameral congress. Members of the Chamber of Deputies are elected for three years and of the Senate for six years, by universal suffrage.

In 1939, developments in Mexico were hampered by stringent economic conditions brought about by a sharp fall in the price of silver, which caused the peso to slump to a new low, and by external pressure on the Government-owned petroleum industry. The European war, disrupting maritime commerce, had disastrous effects on Mexico's markets abroad. Land expropriation and redistribution continued, but the revolutionary social program was overshadowed by the economic crisis and by political activity leading toward the election of a president in 1940 to succeed Lázaro Cárdenas, whose term ends in December of 1940. Administration and opposition party candidates were selected. Foreign relations were concerned with the oil controversy between the Government and the foreign companies whose properties were expropriated in March 1938, and with international conditions arising from the wars in Europe.

The petroleum industry revived remarkably from its depression in 1938, when boycotts in protest of expropriations seriously limited foreign markets. In the first seven months of 1939, production was up 15% and the Government was marketing oil in pre-expropriation quantities, chiefly through barter agreements with Germany and Italy.

In September, however, when the German market, which had been taking 42% of the exported product, was eliminated by war, sales were cut in half. As no new outlets were found, storage scarcity resulted, and it was necessary to curtail production in the closing months of the year. Expected benefits of a United States 50% tariff reduction on oil, effective December 16, did not materialize, for Mexico's quota, determined by her 1938 oil sales to the United States, was only 3.8%. (See also PETROLEUM; UNITED STATES.)

The petroleum administration, known as Petroleos Mexicanos, was further centralized, and steps were taken to nationalize additional properties. In November the Constitution was amended to prohibit the granting of petroleum concessions to private companies in the future. On December 2, the Supreme Court declared

the 1938 expropriations legal, admitting the right of the foreign companies to claim compensation "for capital directly and legitimately invested," permitting the Government to defer payment for as much as ten years, and ruling out reimbursement for the companies "for an expectation of profits from oil still in the ground or for damage suffered through cancellation of concessions." The decision, surprising to neither party involved, exhausted all legal recourse for the companies and the Government prepared to evaluate the properties for compensation as the year closed.

Mexico experienced a third year of economic depression in 1939. Business during the early months was on an upward trend, but in June a slump in silver value abroad brought about a financial crisis. The United States treasury, which had been buying Mexican silver at 43¢ (U.S.) an ounce, lowered the price to 35¢, and the Mexican peso immediately fell from 4.99 to around 6 to the dollar, fluctuating between the two figures for the rest of the year. A rise in the price of foodstuffs and other domestic necessities, in spite of governmental counter-measures, created an acute situation among the people of the nation.

Labour disputes continued throughout the year with strikes against both foreign and Mexican companies. Even school teachers and Government employees struck for higher wages, back salaries or better working conditions. A 12-day bakery strike in the capital, causing a serious bread shortage, was settled April 10 by compromise. In October, five States were temporarily darkened by an electric power and light strike.

A shortage of water power in the Federal district caused the Government to inaugurate a drastic program of electricity conservation from February until July, when summer rains alleviated the situation. Inadequate transportation facilities created serious congestion in the port of Veracruz in April, and elsewhere freight was held up by similar difficulties. The Government continued to subsidize corn, beans and other foodstuff importations in the early months, but summer grain harvests were exceptionally good.

No major expropriations of private industries occurred during the year, but Mexico's drive toward "economic independence" was strengthened in August by legislation restricting property acquisition by foreigners. A steeply-graduated excess profits tax passed the Chamber of Deputies December 22. To stimulate investments, however, a Government fund to guarantee capital and minimum interest on all sums invested in specified industries was approved by Congress for 1940. The fund was to be created from the proceeds of a tax on alcoholic beverages for the next five years.

Mining, the nation's most important industry, suffered from the silver slump and failed to revive as expected during the European war. Copper prices rose 20% in September, but lead and zinc fell in export value and volume as Great Britain confined her purchases to sources within her empire. The 12% export tax on silver was removed to stimulate the industry.

Mexico's political scene was dominated by preparations for the July 1940 presidential election. Bidding for the official National Revolutionary Party's nomination were generals Manuel Ávila Camacho, former minister of war and unofficial choice of the administration; Rafael Sánchez Tapia, a moderate; Francisco Mujica, a leftist; and Gildardo Magana, an administration supporter. Mujica and Magana withdrew and, on November 3, Ávila Camacho was chosen unanimously as the official candidate by the party convention. Rightist opposition factions formed the new National Party of Public Salvation in March with General Joaquín Amaro as a potential candidate. In July, however, Juan Andreu Almazán, recently retired military commander of the North and a popular moderate, declared himself against the administration and became by far the leading opposition figure. After the official

party's nomination, there was a lull in campaign activities while both Ávila Camacho and Almazán conserved their political energies for the ensuing year.

Strongly supported by the official party, which has dominated Mexican politics for ten years, Ávila Camacho was conceded the 1940 election by many observers. Almazán's large popular following, however, with President Cárdenas's promise of a fair election, gave the opposition candidate a chance to win. Almazán's platform, vaguely stated in July, called for breaking down bureaucratic politics, putting the agrarian revolution on a private ownership basis, and further aiding national recovery by close co-operation with the United States. Ávila Camacho's program tentatively drawn up in the official party's new "Six-Year Plan," included the complete nationalization of the oil industry and continued land expropriation and redistribution, but also co-operation with private industry and "gradual reparation of social injustices."

After four years of remarkable political strength and popularity, President Cárdenas suffered some loss of prestige during 1939. In the face of pressing national problems, keenly felt in the capital, he left on an extended trip through the North to look after regional economic and social needs. Gone 97 days, the President travelled through ten States and territories, visiting 252 localities and thereby increasing his political strength in that region. In the capital, however, political and economic unrest was voiced in the election campaigns, and the administration came under sharp criticism.

Minor insurrectionary disturbances continued throughout the year in the various States, but Federal troops quickly suppressed them. In January, the seven-months' hunt for General Saturnino Cedillo, leader of the short-lived revolt in San Luis Potosí in 1938, ended when the rebel chief was killed in a skirmish between Federal troops and his few remaining followers. In Mexico City, anti-Semitic, anti-Fascist, anti-Nazi and anti-Communist riots occurred, but were suppressed by police. Unrest centred about such issues as the admission of Jewish refugees from Germany, Republicans from Spain, and Mexicans from the United States, and repercussions from the various wars in Europe. In December, the Communist minority was sharply criticized for denouncing the President's condemnation of Soviet Russia's invasion of Finland.

A new national census was begun during the year with completion expected in 1940.

Social reforms went forward steadily in 1939 in spite of economic adversity. The Government continued to support labour and agrarian movements, to carry socialized education into the remote Indian villages, and to spend huge sums on irrigation projects. Jewish refugees from Germany were refused admission into Mexico, but immigration restrictions were relaxed to allow several thousand Spanish Loyalists to enter the country, and a few thousand Mexicans of the first and second generation residing in the United States were repatriated. Most of these immigrants were colonized in undeveloped regions.

Agricultural land expropriations continued, especially affecting large sugar estates. During the fiscal year ending Sept. 1939, the Government made 1,317 land grants totalling more than 6,000,000 ac. to 106,829 farmers. Almost 40,000,000 ac. of land, formerly held by large estates, have been redistributed to peasants in communal holdings during the agrarian revolution. President Cárdenas in 1939 set a goal of 50 ac. for each of Mexico's 3,000,000 peasant families.

There was no noticeable religious unrest as in past years. The Catholic church continued to operate peacefully under Government supervision.

Foreign Relations.—Diplomatic relations with Great Britain remained suspended over the petroleum expropriation controversy,

but negotiations between the Government and the American companies were active. Attempts to reach a settlement by reinstating the foreign companies on a joint-operation basis with the Government failed, however, and Mexico showed no inclination to relinquish control of the industry. After the expropriation ruling was upheld in the Mexican Supreme Court December 2, the dispossessed American companies appealed to their own Department of State. As the year ended, however, no official action by the United States was forthcoming.

Mexico took definite stands on almost all major military aggressions in Europe. In the Spanish civil war, Mexico actively supported the Republican cause but, in July, assumed normal relations with the victorious Franco Government. The Government continued to recognize Poland and Czecho-Slovakia after they were conquered, but, in September, declared its neutrality in the European conflict. In the next month it became a signatory party to the inter-American agreement at Panama, which established a neutrality belt around the American waters, and restricted the activities of ships of belligerent nations by coast guard patrols on both shores. (See HISPANIC AMERICA AND THE EUROPEAN WAR.) As a member of the League of Nations, Mexico denounced Soviet Russia's invasion of Finland in December and pledged her aid to Finland.

Education.—Urban education is supported largely by the States; rural education by the Government. There are approximately 20,000 schools of all kinds in the country. The Government is striving to lower Mexico's large percentage of illiteracy (officially estimated at 45%) by spreading primary education among the Indians. In 1938, the Government maintained 12,245 rural and 1,846 urban elementary schools, with 15,714 teachers and 811,790 students in the former and 10,143 teachers and 368,414 students in the latter, at a cost of 67,260,000 pesos. The 1939 budget provided 67,075,000 pesos for education. There are six universities including the National Autonomous university and the National Labor university, both at Mexico City.

Banking and Finance.—The monetary unit is the peso (value: 17.35¢ U.S. in 1939, with parity not yet determined; 20.3¢ in 1938). When the price of silver abroad fell from 43¢ to 35¢ (U.S.), the Bank of Mexico retired from the market and let the peso seek its natural level. The national budget for 1939, largest in Mexican history, called for 445,875,614 pesos (430,920,000 pesos in 1938). Receipts for the first eight months were up 12.3% from the estimated 300,000,000 pesos for that period.

Trade and Communications.—Exports in 1938 totalled 838,126,000 pesos (6% less than in 1937), of which mineral products, principally silver, gold, lead and petroleum, constituted 499,027,228 pesos (or 59.6%), including gold bullion. In the first half of 1939, exports increased in value to 490,300,000 pesos (423,100,000 pesos in the same period of 1938). The principal customer is the United States which took 67.4% in 1938. Great Britain was second (9.4%).

Imports in 1938 totalled 493,323,784 pesos, with automobiles, rayon yarn, machinery and other manufactures the principal commodities. In the first six months of 1939, imports had increased to 306,100,000 pesos (237,100,000 in the same period of 1938). The United States supplied 57.8% of the imports in 1938. Germany was second (18.8%). The devaluation of the peso during the year caused a slight increase in pesos spent and collected as compared with the actual amount of goods exchanged. A significant drop in trade with Germany after war broke out in September offset Germany's gain by previous barter agreements on the trade of the United States and Great Britain.

Mexico's external communications are by steamship service, especially through Veracruz, by three main railways to the United States, and one to Guatemala; by increasingly important air serv-

ice north and south and to the West Indies; and by highway, notably through Nuevo Laredo. There are over 23,750km. of railway, 57% of which is under Government operation. During the fiscal year ending Sept. 1939, 171km. of rails were laid on a line which will link Baja California with the rest of the country, 265km. on the Southeastern line, and 83km. on the projected Uruapan-Puerto Zihuatanejo road. Highway building during the year 1938-39 included the completion of the 680-km. paved road from Mexico City to Guadalajara. Including projects in co-operation with the States, the Government surveyed 936km. of new roads, laid beds for 686km., and surfaced 1,525 kilometres. Among the new airlines established in 1939 was one between Mexico City and Tampico. An airmail service between Mexico City and Bridgetown, Barbados, was also opened. In 1938, Mexico had over 23 lines of air passenger service. In the same year, there were 138,081 telephones (1,337 Government and 136,744 private). During the fiscal year 1938-39, the Government spent 17,976,589 pesos on railway construction, 11,681,717 pesos on highways, and 997,525 pesos on aeroplanes and equipment.

Agriculture and Mining.—Resources are mineral and agricultural. Holding sixth place in world petroleum production, Mexico produced 38,506,000bbl. in 1938. The 1939 output was estimated at 41,700,000bbl., an increase of 8.3%. Mexico is the leading producer of silver (2,520,155kg. in 1938). In the first eight months of 1939 silver production was down 20.2%. Other important minerals include gold, copper, lead and zinc.

Normally almost self-sufficient agriculturally, Mexico suffered a shortage of corn, wheat, beans, and other such produce in the early months of 1939, but good crops were harvested in the summer. The 1939 wheat crop attained the all-time record of 385,000 tons, and corn prospects pointed to a similar record. Important exports are coffee, henequen (hemp), bananas, chicle and chick-peas.

The cattle industry is important in the northern States. Manufactures include sugar and oil refining, textiles, tobacco products, iron and steel, rubber, leather, glass, flour and meat packing. The fishing industry is important on the west coast. A recent national resource is the tourist trade, which revived after a poor previous year. In the first ten months of 1939, foreign visitors entering Mexico numbered 49,287 as compared to 40,130 in the corresponding period of 1938.

Army and Navy.—Mexico's largest appropriations are for national defence (92,984,458 pesos in 1939). The standing army is unofficially estimated at 70,000 men, with 40,000 in reserve. A program is under way to train peasants and thus bring the reserves up to 200,000 in four years. The army had 170 pilots and 70 planes in its air service in 1938, and in 1939 Government contracts called for 40 fighting planes and ten training ships. The navy consists of one coast defence ship, eight gunboats and nine coast guard craft. (See also INTERNATIONAL LAW.)

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Mica. In the discussion of mica we are mainly concerned with sheet mica; although there are many commercial uses for scrap mica, this is a low grade material that falls into a different category from that of sheet mica. Sheet mica is classified according to the standard size of sheet that can be trimmed to shape, and that below the smallest size, but still too large for scrap, goes to splittings, for the production of built-up mica shapes, using a plastic binder. The growing demand for built-up mica has made splittings a feature of the market, with a consumption in the United States about double that of sheet mica.

Of a world total output of about 50,000 metric tons in 1937, apparently about 10,000 tons were sheet and splittings, and the remainder scrap. Production declined rather sharply in 1938 in practically all countries. The output of British India stands foremost, with mainly sheet and splittings, but in recent years considerable amounts of scrap have apparently been included, so that the data available have little meaning. Other British Empire producers include Canada, Rhodesia, South Africa, Tanganyika and Australia, but none of these are of any great commercial importance except Canada, and there output has declined heavily in the past decade.

United States production has likewise dropped, but not so badly as the Canadian; an output of 847 short tons of sheet and 25,200 tons of scrap in 1937 declined to 470 tons of sheet and 20,250 tons of scrap in 1938. Imports dropped by about half in 1938, to 4,530 tons of scrap and ground mica, 175 tons of sheet, and 890 tons of splittings.

Heretofore mica has lacked any satisfactory substitute for its most important uses, but a recent announcement makes public the discovery of an artificial film made from bentonite which gives promise of serving for many of the ordinary electrical uses of mica, but due to a high power factor it has not yet been developed to a point where it can be used in high grade condensers. (See also VERMICULITE.) (G. A. Ro.)

Michigan, twenty-sixth State to become a member of the United States, popularly known as the "Wolverine State"; area, 57,480 sq.mi. (exclusive of 40,000 sq.mi. of Great Lakes' water surface within her boundaries); population (U.S. census, 1930) 4,842,325; (estimate Jan. 1, 1940) 5,405,000. Capital, Lansing, 78,397. Larger cities are Detroit, 1,568,662; Grand Rapids, 168,592; Flint, 156,492; Saginaw, 80,715. Of the State's population, 3,302,075 are urban, or 68.2%; 4,650,171 whites; 192,154 coloured; of the whites, 3,809,903 native born, 840,268 foreign born; about 350,000 of the total population live in the upper peninsula, which comprises about one-fourth of the State's area and possesses nearly one-half of the State's 1,624-mile shoreline (longest fresh-water shore line of any State in the Union).

History.—The beginning of the year witnessed the inauguration of a Republican administration to succeed the "Little New Deal" of the Democratic regime under the outgoing governor, Frank Murphy. Under his successor, Frank D. Fitzgerald, who had been secretary of State (1931-34) and governor (1935-36), it soon became evident that the Republicans were planning sweeping changes not only in the practices inaugurated by the Murphy regime with respect to economic and social problems, but in the recently established Civil Service program, as well. Almost immediately, however, the Fitzgerald administration was embarrassed by widespread publicity given to the opening of numerous gambling establishments in the State, particularly in the neighbourhood of Detroit. Several of the influential newspapers which had vigorously supported Fitzgerald in his fall campaign against Murphy now led an insistent demand that the State police be used to suppress the gambling. Fitzgerald, taking the position that the problem was one for county, rather than State, handling, at first declined to order suppression by State police except in instances where local authorities professed inability to handle the matter. In the face of persistent popular clamour, however, the governor in March finally ordered the State police to clean up the gambling situation.

Governor Fitzgerald died, after a brief illness, on March 16. On March 17, Luren D. Dickinson, who as a candidate for a seventh term as lieutenant-governor (previous terms, 1915-20; 1927-32) had led the Republican ticket in the November election, took the oath of office as Michigan's 54th State governor (the 37th indi-

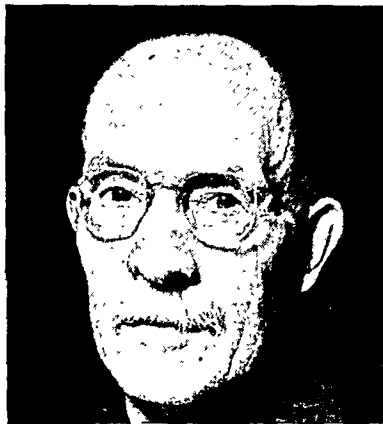
vidual to hold the office). Seventy-nine year old Dickinson had long been known as an active leader of the Anti-Saloon League; his inaugural address as lieutenant-governor had inveighed against "the encircling odours of the seething, boiling, sin-cursed cesspools of crime, insanity, idleness, social putridity, gambling dens, profligacy, waste, industrial upheaval, beer gardens, and road houses. . . ." Even these activities had scarcely prepared the public for the vigour and enthusiasm with which the new governor engaged upon an oratorical campaign against sin as he saw it. This campaign has made Dickinson probably the best-known, certainly the most talked-about, governor in Michigan's history. Severe criticisms by the governor of moral conditions as he found them at a governors' conference in Albany, N.Y., during the summer, drew forth comment from every part of the country, while his colourful account of the temptations of New York city provoked a retort from Mayor Fiorello La Guardia. Before long Michigan people had become used to the governor's claim that he had "a pipeline to God," and suggestions of the order of his proposal that smoking mothers reduce their expenditures for cigarettes by one-half and donate the savings to the depleted State funds for relief failed to arouse much comment. Political observers, however, were impressed with the uniformly large audiences attending the Sunday religious rallies addressed by the governor in various parts of the State.

Meanwhile the State legislature, in a session lasting until the middle of June, had passed nearly 370 measures. Perhaps the most important was a new civil service bill, to take the place of the one passed during the Murphy regime. Although Republican leaders insisted that the principle of civil service was being adhered to, the Michigan Merit System Association and a host of other non-partisan organizations were bitterly opposed to the new measure. The measure removed from the civil service about one-half of the 16,000 positions which had been under civil service at the beginning of the year. A great deal of pressure, much of it non-partisan in character, was put upon Governor Dickinson to veto the measure, but he signed it. An oil control act drafted by the Department of Conservation and sponsored by the Oil and Gas Association of Michigan was described by State Geologist R. A. Smith as the best legislation of its kind in the nation. Other acts passed by the legislature made a new requirement of oath of allegiance of teachers, instructors, and professors; provided for the raising of standards for nurses; abolished the Legislative Council established in 1933. Twenty-one bills were vetoed by the governor; three were passed over his veto. Harold D. Smith, who resigned as State budget director to become director of the Federal budget, was succeeded first by Grover C. Dillman, and then by Gus T. Hartman. In the place of William Brownrigg, who resigned to accept the position of director of personnel in the Federal Department of Justice, Paul T. Anderson became State personnel director of civil service. Richard T. Frankenstein, C.I.O. leader, whose appointment by Governor Murphy to the State Emergency Relief Commission had provoked much criticism, was replaced by Governor Fitzgerald with Carleton H. Runciman.

Measures of administrative reorganization undertaken by the legislature were accompanied by a program of sweeping changes inaugurated by Governor Fitzgerald and continued by Governor Dickinson with respect to the personnel of appointive offices. The Public Utilities Commission, which Governor Fitzgerald alleged was partisan, was abolished by the legislature and replaced by a Public Service Commission. Replacing a social welfare act which had been nullified by popular referendum in the Nov. 1938 election, a new law created a State Social Welfare Commission which was directed to co-ordinate all the various responsibilities and obligations of the Emergency Welfare Relief Commission, the State Welfare Commission, the Old Age Assistance Bureau, and other

State and county agencies. Walter F. Gries became chairman of this commission. Under terms of the new act, the principal responsibility for the administration of relief was placed upon the county social welfare board. Due in part to resignations, the personnel of the Civil Service Commission was completely reconstituted, with William A. Irving the new chairman. Before the end of the year, the State Liquor Control Commission had been simi-

larly completely changed in membership, with Orrin A. DeMass the new chairman. Melville B. McPherson became chairman of the State Tax Commission; the resignation of one of the Democratic members gave the Republicans control of the commission. Brigadier General Edward G. Heckel succeeded Hilmer Gellein as director of the Department of Corrections; new wardens were appointed for the State Prison of Southern Michi-



LUREN D. DICKINSON became governor of Michigan in March 1939

igan and for the Michigan Reformatory. Dr. H. Allen Moyer, Governor Dickinson's personal physician, replaced Dr. Don W. Gudakunst as State health officer.

In the spring election, the Republican party swept to complete victory. Henry M. Butzel and Howard Wiest were re-elected justices of the State Supreme Court, and Eugene B. Elliott was re-elected State Superintendent of Public Instruction. Junius A. Beal and Ralph Stone, Republicans, who after serving 32 years and 16 years, respectively, as regents of the University of Michigan, chose not to stand for re-election, were succeeded by Harry G. Kipke, formerly football coach of the University, and J. Joseph Herbert. Melville B. McPherson and Forest M. Akers were chosen to replace Democrats on the State Board of Agriculture, while the election of Mary Farnsworth as a member of the State Board of Education made that body completely Republican in personnel.

Education.—Under the superintendency of Eugene B. Elliott, the State Department of Public Instruction continued to place particular emphasis upon vocational guidance and upon the development of a State-wide curriculum program. A committee was appointed to formulate a program in conservation education for Michigan schools. The institutions of higher learning in general reported increases in enrolment. At Michigan State college in East Lansing important buildings were erected for class-room, for athletics, and for dormitory purposes; at the University of Michigan in Ann Arbor a \$5,500,000-building program, with particular emphasis upon the construction of dormitories, was carried through.

Charities and Correction.—The brief age (six months) of the recently created Social Welfare Commission rendered impossible any accurate appraisal of its effectiveness in dealing with Michigan's complex \$45,000,000-a-year welfare and relief problem; in view of the fact that county "home rule" administration of relief did not come into being until December 1, the probability of success of this plan was at the end of the year still entirely a matter of conjecture. The Department of Corrections reported that from January 1 to December 1 the number of prisoners incarcerated in State penal institutions rose from 7,299 to 7,722. As of June 30, 91% were native-born Americans, 43% Michigan-born.

Banking.—F. Elliott, Jr., State Banking Commissioner, at the end of the year reported that the resources of 351 commercial banks under his supervision increased from \$701,000,000 to

\$747,000,000 during the year; deposits from \$635,000,000 to \$677,000,000. Of 64 receiverships supervised by the State Banking Department in 1933, only 22 were still in existence at the end of 1939; 20 receiverships were closed during the year.

Agriculture, Manufactures, Mineral Production.—During 1939 the State Department of Agriculture under Elmer A. Beamer continued a program working toward the elimination of animal diseases, especially among dairy herds, and of American Foul Brood among bees; the analysis of agricultural seeds; the inspection of orchards and nurseries. In the automotive and construction industries in particular, marked gains in business were reported. The longest and costliest labour dispute in automotive history, a 54-day deadlock between the Chrysler Corporation and the C.I.O. United Automobile Workers reached a close at the end of November with a compromise including a wage increase amounting to over \$5,000,000 a year.

Nearly 1,500 drilling permits for oil and gas were issued during 1939. Output of the iron mines on the Marquette iron range showed an increase toward the close of the year; the outbreak of war in Europe stimulated the copper mining industry, also. By the end of November over 68,000,000 tons of shipping had passed through the locks at Sault Ste. Marie, an increase of approximately 29,000,000 tons over the corresponding period of 1938.

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Michigan, University of. Construction of the new buildings provided with the help of the Federal Public Works Administration was the most important problem before the University of Michigan in 1939. The building program included a large quadrangle of men's residence halls, housing 932 men, a second smaller quadrangle for 400 men, a dormitory for medical students, a home for hospital interns, a women's dormitory housing 392 women, a new building for children's and post-graduate dentistry, and a student health service with hospital facilities. In addition the heating and power plant had to be increased to care for the new buildings. The administration of university residence halls, except those for which special provisions are made in the deeds of gift, has been committed to a board of governors and a director of residence halls. The house plan adopted by the governors looks forward to making the student's experience a genuine contribution to his or her education, broadly conceived in terms of general culture and communal living.

In June 1939, it was decided to transfer the Department of Landscape Design, formerly part of the College of Literature, Science, and the Arts, to the College of Architecture, and to change its name to "Department of Landscape Architecture." The name of the college, also, was changed to "College of Architecture and Design" in order to recognize the growing importance of the curriculum in decorative design. (A. G. R.)

Microphotography: see LIBRARIES.

Midget Auto Racing: see AUTOMOBILE RACING.

Midway Islands, a group of two small islands and several sand islets in lat. 28° 13' N., and long. 177° 23' W., 1,149 miles N.W. of Honolulu, belonging to the United States of America. The larger is Sand island; about 850ac.; maximum height above sea level, 43 feet. The other is Eastern island; about 328ac. and very low. The islands are enclosed in a circular reef about five miles in diameter, about four-fifths of which is above water. There are no native or permanent inhabitants.

The group was discovered in 1859, by Captain Brooks, bark "Gambier," who took possession in the name of the United States. Captain Reynolds, U.S.S. "Lackawanna," took possession formally on Aug. 28, 1867.

Since 1903 the islands have been under the jurisdiction of the U.S. Navy Department. Sand island is the site of a commercial cable station. The Navy Department has licensed Pan American Airways to establish certain facilities for use in connection with its transpacific commercial airline.

The 76th Congress authorized the Navy Department to construct a seaplane base at Midway and appropriated approximately \$5,000,000 for the purpose. The work, involving dredging for a turning basin for tenders and oil tankers, ramps, barracks and administration buildings and public works to accommodate permanently one squadron of patrol planes and 300 men, was in progress (Jan. 1, 1940). (L. S. F.)

Military and Naval Forces: see ARMIES OF THE WORLD; AIR FORCES; NAVIES OF THE WORLD.

Milk. The canned milk business, a highly profitable "war baby" among industries between 1914 and 1918, revived suddenly with the outbreak of hostilities in Sept. 1939 and during the month wholesalers reduced manufacturers' stocks of evaporated milk to the lowest point since 1922. Prices of condensed and evaporated milk advanced on the belief that war would again create a huge demand for this highly compact, non-perishable and easily transported food.

Condensed milk output had declined, in comparison with 1938, every month from Feb. to Aug. 1939, but increased when war became imminent. Evaporated milk output, which had roughly paralleled 1938 production, was stepped up sharply in September. From January 1 to September 30 production of condensed milk in the United States was 175,130,000lb. and 195,412,000lb. in 1938. In the same period manufacture of evaporated milk was 1,753,056,000lb. in 1939 and 1,737,479,000lb. in 1938. Stocks in manufacturers' hands Oct. 1, 1939 and 1938, and the five-year average (1934-1938) were:

	1939 lb.	1938 lb.	Five-year average lb.
Condensed milk	13,780,000	27,055,000	24,461,000
Evaporated milk	135,135,000	398,287,000	260,938,000
Dry milk (skim)	11,931,000	52,702,000	35,129,000

The milk flow in 1939 in the United States was slightly under 1938 owing to dry weather during the summer in some areas. On September 1, however, production per cow was again almost at the record figure of 1938 for that date, according to farmers who make crop reports to the Department of Agriculture. The number of heifer calves kept for production increased. (See DAIRYING.) The year 1939 was one of wide-spread dissension in the milk industry. A strike of milk wagon drivers disrupted deliveries in New York. The Department of Agriculture set up local milk control boards to foster agreements under which producers would receive a fairer price. Although this arrangement, which established zone prices per 100lb. in milk sheds, provided a higher price to farmers, it was not entirely satisfactory. Some producers complained that no difference was made in price between milk of high butterfat content and milk of the minimum allowable fat content. The Federal Government prosecuted in Chicago an action against milk distributing companies, the Pure Milk association of 12,000 farmers in Illinois, Indiana, Wisconsin, and Michigan, the Milk Wagon Drivers union and officials of the Chicago Board of Health. These defendants were charged with combining to fix prices, control supply and suppress competition. Judge Charles



"SOME JUMP" is the title of Jensen's complaint in *The Chicago Daily News* against the rise of retail milk prices in 1939

Woodward of the Federal court ruled that other acts of Congress had removed the marketing of farm products from the jurisdiction of the Sherman Anti-Trust Act.

(For the milk situation as to dairy herds, see DAIRYING.)

(S. O. R.)

Milk Containers, Paper: see CELLULOSE PRODUCTS.

Miller, Joseph Dana (1864-1939), American economist, was the leading exponent of the Single Tax movement after the death of Henry George in 1897. Born in New York city on July 1, he was educated by private tutors and had written many published verses and critical articles before he met George and became a fervent convert to the latter's doctrine of limiting taxation to land. In 1901 he founded the *Single Tax Review* (later *Land and Freedom*), international journal of the Single Tax movement, which he edited for 38 years. Miller published two collections of poetry, *Verses from a Vagrant Muse* (1894) and *Thirty Years of Verse Making* (1926). He died at Jersey City, N. J., on May 8.

Mineral and Metal Prices and Production.

The first of the accompanying charts shows the range of prices for the leading metals and minerals during 1939 on the New York and London markets. The outbreak of war in Europe caused prices to advance, but this was largely confined to commodities in the strategic materials group, others showing little change; however, since the British strategic group is much larger than the American, the general effect on the market was correspondingly greater, but control of prices for all important commodities was put into effect by the British Government before the market could be seriously affected. In the United States there was a general decline of prices through the first half of the year, the *E&MJ* index of non-

Mineral and Metal Prices in 1939

London market as reported by the Metal Bulletin and Mining Magazine									
Grade and Units	Average	Close	Low	High	Open	Units	Grade	Average	Close
Aluminium	20.000	20.00	20.00	20.00	20.00	Long ton	98-99% Domestic, 99%	20.000	20.00
Antimony	12.359	14.00	11.25	14.00	14.00	"	Chinese	12.359	14.00
Arsenic	3.00	16.50	3.00	16.50	16.50	Pound	Foreign	3.00	16.50
Bismuth	64.057	75.00	50.00	75.00	75.00	"	48% Rhodesian.	64.057	75.00
Cadmium	27.00	85.00	27.00	85.00	85.00	Long ton	98-99% C	27.00	85.00
Chromium, Ore	10.065	12.275	10.065	12.275	12.275	Pound	Standard.	10.065	12.275
Chromium, Metal	10.727	12.400	10.727	12.400	12.400	Long ton	4-6% C	10.727	12.400
Copper	35.00	35.00	35.00	35.00	35.00	Long ton	Official.	35.00	35.00
Gold	5.053	5.50	5.053	5.50	5.50	Ounce	50% No. African	5.053	5.50
Iron, Ore	27.00	27.00	27.00	27.00	27.00	Long ton	Basic	27.00	27.00
Lead, Fig.	4.75	4.75	4.75	4.75	4.75	"	80% R/C	4.75	4.75
Lead, Ore	54.38	54.38	54.38	54.38	54.38	"	Foreign	54.38	54.38
Metal	4.85	4.85	4.85	4.85	4.85	"	Ingots, sticks	4.85	4.85
Magnesium	103.940	103.940	103.940	103.940	103.940	Pound	50-51% C	103.940	103.940
Manganese, Ore	103.940	103.940	103.940	103.940	103.940	Unit	Ingots, sticks	103.940	103.940
Mercury	103.940	103.940	103.940	103.940	103.940	Long ton	Refined	103.940	103.940
Molybdenum, Ore	103.940	103.940	103.940	103.940	103.940	Unit	Spot, bars	103.940	103.940
Nickel	103.940	103.940	103.940	103.940	103.940	Long ton	Standard.	103.940	103.940
Nickel	103.940	103.940	103.940	103.940	103.940	Ounce	65%	103.940	103.940
Palladium	103.940	103.940	103.940	103.940	103.940	Pound	80-85% V.O.	103.940	103.940
Platinum	103.940	103.940	103.940	103.940	103.940	Unit	52% R/C	103.940	103.940
Selenium	103.940	103.940	103.940	103.940	103.940	Long ton	G. O. B.	103.940	103.940
Silver	103.940	103.940	103.940	103.940	103.940	Unit		103.940	103.940
Tellurium	103.940	103.940	103.940	103.940	103.940	Pound		103.940	103.940
Tin	103.940	103.940	103.940	103.940	103.940	Ounce		103.940	103.940
Tungsten, Ore	103.940	103.940	103.940	103.940	103.940	Unit		103.940	103.940
Vanadium, Ore	103.940	103.940	103.940	103.940	103.940	Pound		103.940	103.940
Zinc, Ore	103.940	103.940	103.940	103.940	103.940	Unit		103.940	103.940
Zinc, Metal	103.940	103.940	103.940	103.940	103.940	Long ton		103.940	103.940

(a) Cents per pound. (b) Dollars per pound. (c) Dollars per long ton, c.i.f. Atlantic ports. (d) Cents per pound of primary metal content. (e) Dollars per fine ounce. (f) Dollars per short ton. (g) Cents per long ton unit, c.i.f. Atlantic ports. (h) Dollars per flask, 76 pounds. (i) Cents per pound of contained Mo S₂. (j) Cents per fine ounce. (k) Dollars per short ton unit. (l) Cents per pound of V₂O₅ contained. (m) *Eng. Min. Jour.*

ferrous metal prices declining from 77.12 in January to 71.95 in August, followed by a rise to 84.25 in October and a decline to 82.89 in December. The average for the year was 77.71, against 73.67 in 1938 and 90.86 in 1937.

The second table gives the 1938 mineral and metal production for the more important producing countries and the leading commodities, in addition to which production data will be found in the treatment of many of the individual subjects throughout the volume. The *Mineral Industry* index for aggregate world mineral production dropped to 139 in 1938, from 150 in 1937; such preliminary data as are available for 1939 indicate a recovery, but probably not to the level of 1937 unless war demand materially boosts output in the last quarter. (G. A. Ro.)

Mineralogy. As retiring president of the Mineralogical Society of America, Thomson reviewed the history of the study of ore minerals (*American Mineralogist*, March). The new minerals teepite, gratonite, overite, goldschmitine, salesite and shortite were described (*ibid.*, January, February, March, April, June and August). Extensive studies on the properties of the mica minerals were made by Volk, Gruner, Hendricks, Jefferson (*ibid.*, April, October, December) and Wright (*American Journal of Science*, October). Simpson reported on new and little known meteorites of Western Australia (*Mineralogical Magazine*, No. 163). Other meteorites were described as follows: the Soper, Oklahoma, by Wood and Merritt; Rosebud, Milam county, Texas, by Bullard; Santa Luzia de Goyaz, by Meen (*American Mineralogist*, January, April, September); Wood's Mountain, North Carolina, by Perry (*American Journal of Science*, August); and Huckitta, by Madigan (*Mineralogical Magazine*, No. 165). Important new methods for mineral determination were reported: electric counter, by Hurlbut (*American Journal of Science*, April); specific gravity, by Jahns, Berman, and Ksanda and Merwin (*American Mineralogist*, February, July, August); indices of refraction, Quirke and Lacy (*ibid.*, November); feldspar twins, Emmons and Gates (*ibid.*, September); dichroism, Slawson and Thibault (*ibid.*, August).

Gem Minerals.—Eppler continued his studies on the ideal cutting of the diamond and other stones (*Zentralblatt fuer Mineralogie*, etc., No. 2, and *Neues Jahrbuch*, etc., No. 1). Bauer made a comprehensive study of certain zircons (*ibid.*, No. 2). Bergheimer (*ibid.*, No. 1) and Kraus and Slawson (*American Mineralogist*, November) discussed the variation of hardness in the diamond in relation to cutting and crystal structure. Leinz described the large President Vargas diamond, Minas Geraes, Brazil, weighing 726.6 karats (*Zentralblatt*, etc., No. 4). What is

reported to be the world's largest crystal of topaz, weighing 153lb., was secured by the United States National Museum, Washington. Other notable contributions were Ball's "The Diamond Industry" (*Jeweler's Circular-Keystone*, July), the enlarged third edition of Kraus and Slawson's *Gems and Gem Materials*, and Spencer's seventh series of biographical sketches of 30 mineralogists, recently deceased (*Mineralogical Magazine*, No. 165).

Necrology.—The toll of eminent mineralogists during 1939 was very heavy. G. Cesàro, 40 years professor of crystallography and mineralogy, University of Liège, Belgium, and twice president of the Belgian Academy of Sciences, died January 20, age 90. William Ebenezer Ford, member of the faculty of Yale university for 40 years and editor of various revisions of the Dana books on mineralogy, died March 23, age 61. William Arthur Tarr, for 28 years with the University of Missouri, author of *Introductory Economic Geology* and *Introduction to Geology*, died July 28, age 58. Alfred Harker, long associated with the University of Cambridge, England, author of widely used texts on minerals and rocks, died July 29, age 80. Edward Sydney Simpson, distinguished Australian mineral chemist, recipient of the W. B. Clarke and Kelvin medals of the Royal Societies of New South Wales and of Western Australia, respectively, died at South Perth, August 30, age 64. Walde-mar Lindgren, formerly of the Massachusetts Institute of Technology, author of *Mineral Deposits*, recipient of the Penrose medal of the Geological Society of America and the Wollaston medal of the Geological Society of London, died November 3, age 79. (See also MINERAL AND METAL PRICES AND PRODUCTION.)

(E. H. Kr.)

Mines: see GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; INTERNATIONAL LAW; SHIPPING, MERCHANT MARINE; SUBMARINE WARFARE; TACTICS IN THE EUROPEAN WAR.

Miniature Photography: see PHOTOGRAPHY: General Photography; PHOTOGRAPHY, MINIATURE CAMERA.

Mining: see MINERAL AND METAL PRICES AND PRODUCTION; see also under separate minerals.

Minnesota, a north central State of the United States popularly known as the "Gopher State," has an area of 84,682 sq.mi., of which 3,824 are water. Population, U.S. census of 1930, 2,563,953, estimated July 1, 1937, 2,652,000. Capital, St. Paul, 271,606. The only city in the State with a larger population was Minneapolis, 464,356. Duluth had 101,463. Of the State's population 1,257,616, or 49%, were urban. There were 2,538,973 whites, 9,445 coloured, 2,150,697 native-born and 388,294 foreign-born.

History.—Minnesota ranked comparatively low among the States in percentage of jobless as indicated by the 1937 unemployment census, with 98,495, or 3.8% of the population, unemployed. WPA spent \$52,000,000 in Minnesota in 1939, giving work to a monthly average of 51,788 persons, and PWA funds totalled \$16,151,386.

Two men were killed and 17 were injured in a WPA strike in July 1939. Ten thousand employees remained idle for several weeks, and loss in materials and wages amounted to \$500,000. Major labour disputes affected a farm implement machinery company, taxi drivers, elevator operators, a leather goods plant and a coke plant. The labour relations law went into effect on April 24; the labour conciliation board has been notified of more than 330 labour disputes, but in only a few instances have they reached the strike stage. "Only 2,185 were involved in strikes in 1939," according to Governor Harold E. Stassen.

The 1939 legislature convened on January 3 and adjourned on April 19, having spent 76 days in actual session. Fewer bills were introduced than at any session since 1931. Governor Stassen made

THE MOVEMENT OF CRYSTALS OF ATOMS is recorded in motion pictures as a strip of steel is stretched in a hydraulic tensile machine



an unusual record in that every proposal that he presented to the legislature in his inaugural message was enacted. Headlining the list is a sweeping reorganization act, which abolished three administrative boards and consolidated many others. A "good civil service law," the governor had declared, "will become the cornerstone of our administration." Under the act passed, a civil service department, headed by a board consisting of three members and the newly appointed director, Kenneth Pennybaker, had control of more than 12,000 State employees. The Labor Relations Act, one of the significant new laws enacted, stressed arbitration and conciliation. It was administered by a labour conciliator appointed by the governor. Other laws passed by the 1939 session were the Loan Shark Act and the Homestead Lien on old-age pensioners. The four-cent State gasoline tax was continued until Sept. 1940, and the royalty tax on iron ore was increased 1%, making a total tax of 9% on iron ore for 1939-40. The executive council, the State board of control, and the commissioner of administration and finance were replaced by the commissioner of administration, the social security department and a single tax commissioner. At the end of the year the governor said that the State debt had been cut down by more than \$5,000,000 and he reported economies in the cost of State government.

Education.—Minnesota school enrolment for 1938-39 was 349,761 pupils, 13,904 teachers; total public school expenditure, \$1,183,568. The University of Minnesota had a regular enrolment of 17,200 students in 1939, and a grand total of 37,810 students, including all branches and sessions. It ranked second in the U.S. in enrolment. Minnesota's educational system numbered 10 colleges in addition to the State university, 647 high schools, and six teachers' colleges.

Charities and Correction.—The State board of control and the State relief agency, abolished by legislative act in 1939, have been replaced by the Department of Social Security which is composed of three divisions, namely, public instructions, social welfare, and employment and security. Each division is headed by a director appointed by the governor for a four-year term. In 1939 it had general control over 19 State institutions and supervision of 14 county tuberculosis sanatoria. An average of \$20.71 per month was received by 66,377 old-age pensioners.

Banking and Finance.—On June 30, 1939, there were 677 banks (192 of them national) with deposits of \$699,960,505 and resources of \$781,744,686. Taxable valuation of real and personal property in the fiscal year ending June 30, 1938, was \$1,330,928,660. Moneys and credits for 1938 were \$684,747,539. The net State debt on June 30, 1939, was \$130,497,183.

Agriculture, Manufactures, Mineral Production.—In 1938 Minnesota had 175,143 farms, with a total area of 29,849,507 acres. The total value of all unplotted real estate in 1938 was \$1,488,297,528; the gross income from crops, \$85,181,000, and from livestock and livestock products, \$276,001,000. Measured by total gross farm income, Minnesota ranked 15th among the States. It led in production of butter, with 301,604,000 lb., in 1938; in barley, with 48,020,000 bu.; in flaxseed, with 4,756,000 bushels. It stood second in production of oats, with 128,700,000 bu., and fourth in corn, with 157,535,000 bushels.

The total 1938 payroll was \$514,109,086 with manufacturing accounting for 83% of that total. One of the important industrial activities in Minnesota is printing, which ranks third, with meat packing first and flour milling second. The mining output in 1938 amounted to 14,535,744 gross tons of iron ore and the value of mineral products, 1938, was \$44,361,534. This was a decrease of 70% from the record total in 1937.

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nesota Historical Society (1922-30); T. C. Blegen, *Building Minnesota* (1938), and *Minnesota: Its History and Its People*, a syllabus, University of Minnesota Press (1937); *Minnesota: A State Guide*, Federal Writers' Project (1938). (T. C. B.)

Minnesota, University of. The university continues to increase on all enrolment bases and ranked second among American universities in regular collegiate enrolment for the 1938-39 fall quarter. The net total enrolment for the year which closed June 30, 1939, was 37,810, of whom 16,817 were women. The 1939 legislature provided funds for a Field Crops building on the farm campus. A dormitory for married graduate instructors was completed. Other buildings under construction include the \$2,000,000 Coffman Memorial Student Union, a women's dormitory, a journalism building, a museum of natural history, and a student health service building for the farm campus. The university in 1939 suffered heavy losses in the deaths of Dr. William J. Mayo, a member of the board of regents since Jan. 1907, and his brother, Dr. Charles H. Mayo, professor emeritus. In the fall of 1939 the medical and dental schools celebrated 50th anniversaries in connection with which scientific conferences were held. The university is one of nine schools carrying on graduate dental work with complete staffs and laboratory facilities. The deanship of the graduate school, vacant since the elevation of Dr. Guy Stanton Ford to the presidency, was filled by the appointment of Dr. Royal N. Chapman, formerly faculty member. A naval R.O.T.C. unit was authorized beginning with the academic year 1939-40 and participation in the experimental program of the Civil Aeronautics Authority which began in the spring of 1939 is being continued. Far-reaching programs for co-ordinating fine arts activities and student personnel activities were initiated. (G. S. F.)

Minorities. The Peace Treaties of Paris in 1919 reduced the number of national minorities under alien domination in Europe very considerably. The frontiers drawn corresponded more faithfully to the ethnical conditions of Central and Eastern Europe than the pre-war situation did. Many smaller nationalities received their independence. The new frontiers, however, left for historical, economic, and strategic reasons, large minority groups outside the countries where their co-nationals formed the majority of the population. The Peace Treaties established a system of protection for racial, linguistic and religious minorities through the League of Nations, so as to assure to the remaining minorities equality of treatment in the new states, where also newly introduced democratic constitutions proclaimed full civic rights for all inhabitants. The year 1939 witnessed the final collapse of this system of protection for the minorities in Central Europe. The breakdown of the League of Nations and the aggression of National Socialist Germany against Czecho-Slovakia and Poland completely destroyed the system built up at Versailles. Nationalities like the Czechs and the Poles which had in 1918 acquired their independence lost it and were subjected to a treatment the atrocity of which has no parallel in modern European history. All protection and all democratic guarantees for minorities were destroyed. Germany's aggression resulted in a situation for the minorities infinitely worse than that which had existed in the post-war years and definitely worse than that before 1914.

As a result of her dismemberment in 1938, Czecho-Slovakia at the beginning of 1939 contained only insignificant numbers of minorities. The German minority, although dispersed widely over the territory of the republic, claimed, however, a special status and the right of constituting itself as an almost independent state within the state and of exercising a decisive influence upon the political and cultural life of Czecho-Slovakia. Very soon it be-



THOMAS' CARTOON VERSION in *The Detroit News* of the old political adage that he who swallows minorities swallows poison.

came clear that the Czech claims had been fully justified according to which the Czechs could only exist economically and strategically by the inclusion of the Sudetenland and the maintenance of the historical frontiers of Bohemia and Moravia. In March 1939 Germany occupied Bohemia and Moravia, established her protectorate over the Czechs and subjected them to the rule of National Socialism. It now became evident that the German intention, in spite of solemn declarations made for propagandist purposes, had never been confined to uniting German minorities outside the Reich territory with the German Reich, but aimed at the domination over foreign nationalities which thus became subject minorities within the German Reich. Whereas the Peace Treaties in 1919 had incorporated over 3,000,000 Germans in Czechoslovakia, under the protection of the minority treaties of the League of Nations and with all the guarantees of equality and civil liberties embodied in a democratic constitution, the German destruction of the Peace Treaties subjected more than 7,000,000 Czechs, without any guarantees for their rights or liberties, to the National Socialist regime with its peculiar concepts of law, liberties and racial equality. The German aim at the incorporation of alien minorities was carried a step further by the conquest of Poland and the subjection of about 20,000,000 Poles. The German Government openly introduced in Poland its principles for the treatment of minorities. It proclaimed the racial inferiority of the Poles who therefore could not claim equal treatment with the German master race. They were to be completely eliminated from those parts which Germany wished to annex outright. In the other parts they were allowed to continue to exist as a helot race performing subordinate economic functions, but deprived of higher education, of the possibility of forming a leader class and of any opportunity for economic or social rise. Thus they should be prevented from ever again asserting their national aspirations or rights and should be transformed into a denationalized and subservient mass without any will to resistance. A similar fate was to fall upon the Czechs and other minorities within the orbit of Germany. The theory of racial inequality with all its consequences, first applied only to the Jews, was now applied to other nationalities as well.

A departure concerning minorities was inaugurated by Germany

in the fall of 1939 by the organized shift of German minorities from the Eastern European countries to Germany. The beginning was made with the German population in Italian South Tyrol. The Germans living there received the right of choosing between emigration to Germany or denationalization in Italy. This agreement was originally intended to remove the possible source of conflict, presented by the German problem in South Tyrol, between the two axis partners. After the conquest of Poland the Germans proclaimed the extension of the principle of the "repatriation" of the German minorities to all Eastern European countries. The German minorities in the Baltic countries, in the Soviet Union, in Hungary, in Rumania, and in Yugoslavia were ultimately to be "repatriated." Most of these minorities were no recent emigrants from Germany, but groups long established in their countries of residence, many of them living there for centuries, having taken firm root in the lands of their birth and contributed considerably to their economic and intellectual development. Now the "return" to the racial "fatherland" was demanded from them as a racial duty. So far the transfer of the German minorities in Latvia and Estonia has been carried out, in both cases with great speed and without much consideration for the traditional feelings and acquired interests of these minorities who had lived in the Baltic countries for many centuries. German minorities were also "repatriated" from the eastern parts of Poland which had been incorporated into the Soviet Union. All these German minorities brought into the Reich were to be settled in former Polish and Czech territories to help to hasten the process of Germanization.

Different was the situation in the parts of Poland incorporated into the Soviet Union in the fall of 1939. In this case no new minority problem was created. The population of the eastern provinces of Poland was ethnically and linguistically Ukrainian or White Russian, not Polish, and joined therefore the large Ukrainian and White Russian population living in the Ukrainian and White Russian republics which form part of the Soviet Union. In conformity with its principles of racial equality, the populations incorporated into the Soviet Union were treated on a footing of complete equality and cultural autonomy, and cannot therefore be regarded as minorities in the technical sense of the word.

As regards other minorities in Central and Eastern Europe, it may be briefly stated that the fate of the Jews deteriorated rapidly with the extension of National Socialist influence, and pressure for their emigration was intensified not only in Germany, but also in Hungary and Rumania (See ANTI-SEMITISM; REFUGEES). Especially deplorable was the situation of the Jews in the parts of Poland conquered by Germany. They were subject there to conditions of starvation and segregation intended to diminish their numbers rapidly. The rapprochement between Hungary and Yugoslavia led to an improvement of the position of the Hungarian minority in Yugoslavia which amounts to about 500,000. Rumania, whose considerable minorities in Transylvania, in Bessarabia, in Bukovina, and in the Dobruja, caused much anxiety to the Rumanian Government, tried to improve the situation of her minorities, especially of the 1,400,000 Hungarians in Transylvania. The minorities were invited to enter the Party of National Renaissance, the only existing political party in Rumania. A new cabinet post was created to deal specially with the interests and situation of the minorities. A new minority problem was created in Hungary by the annexation of Carpathian Ukraine or Ruthenia in March 1939. The newly annexed territory was granted a limited autonomy and the Ruthenian language was recognized as the second official language in the territory.

A great deterioration in the position of minorities occurred in Spain where the victory of General Franco abolished the autonomy gained by the Catalan and Basque minorities under the liberal regime of the Spanish republic. Not only were the regional auton-

omies abolished, but the use of the Catalan and Basque languages was strictly forbidden and these two minority peoples were subject to a ruthless policy of denationalization. In the Near East the situation of the ethnical and religious minorities did not evoke any special complaint during 1939. The situation in Palestine cannot be treated in this connection, as the dissatisfaction in Palestine which led to the long-lasting unrest and revolts did not emanate primarily from the Jewish minority, but from the Arab majority (see PALESTINE). In Syria the existence of minority demands served as a pretext for the French Government to abrogate the existing constitution and to introduce a decentralization of the administration in disregard of the wishes of the large majority of the population. In British India the tension between the Hindu majority and the Mohammedan minority did not abate and was regarded by the British Government as the principal obstacle for the granting of immediate dominion status to India. In Canada the French minority showed its loyalty to the dominion and to the Empire on the occasion of the outbreak of the European war, and elections held in Quebec in Oct. 1939 confirmed this trend. (For fuller figures on Jews, see JEWISH RACE, DISTRIBUTION OF.)

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Minor League Baseball: see BASEBALL.

Mint, United States: see COINAGE.

Miquelon: see ST. PIERRE AND MIQUELON.

Missions: see FOREIGN MISSIONS.

Mississippi, admitted as a State in 1817; popularly known as the "Bayou State"; area, 46,810 sq.mi.; population (U.S. census, 1930), 2,009,821; (estimate July 1, 1937), 2,023,000. Capital, Jackson, 63,000, largest city in the State. Of the State's population in 1930, 340,964 were urban, or 16.9%; 1,000,103 whites; 1,009,718 coloured; 1,999,429 native born; 7,145 foreign born.

History.—The State of Mississippi votes solidly the Democratic ticket. For the period 1940-44 the principal officers of the State are: governor, Paul B. Johnson; lieutenant-governor, Dennis Murphree; secretary of State, Walker Wood; attorney-general, Greek L. Rice; State tax collector, Carl N. Craig; State treasurer, Lewis S. May; superintendent of education, J. S. Vandiver; presiding officer of the State senate, lieutenant-governor, Dennis Murphree; presiding officer of the house of representatives of the State, Sam E. Lumpkin. The State senate has 49 members in addition to the presiding officer, the lieutenant-governor. The house of representatives has 140 members. In the membership of the State legislature farmers predominate with a total of 67 in the two houses; lawyers, 59; teachers, 23; merchants, 9; insurance agents, 5; with 13 other occupations represented in the membership with from five to one member. All members of the legislature are members of the Democratic Party.

Education.—The State maintains two systems of public schools, one for whites and one for Negroes, as required by the

constitution. Consolidation of rural schools has been very extensive in the past decade, the rural schools of all 82 counties of the State having been to some extent consolidated.

Banking.—There are in the State 181 State banks, including 22 branch banks, and 24 national banks, including one branch bank. Bank resources stood at \$220,049,522 on June 30, 1939, with deposits at \$191,830,992.

Agriculture and Manufactures.—Agriculture provided direct employment for 66.8% of the State's total population. Sixty-six per cent of the total land area of the State is used for agricultural purposes, there being 311,683 farms covering 19,655,413 ac. in 1935, with a crop output of \$114,327,000, of which \$89,883,000 was cotton and \$14,797,000 was cottonseed.

Manufacturing in recent years has developed very rapidly, particularly manufacturing having to do with the use of cotton and the use of wood products. (A. B. Bu.)

Missouri, second State carved from the Louisiana Purchase, admitted to the Union in 1821, popularly known as the "Show Me" State; area, 69,420 sq.mi.; population according to the U.S. census of 1930, 3,629,367, estimated July 1, 1937, 3,989,000. Capital, Jefferson City, 21,596. The four largest cities (1930) were: St. Louis, 821,960; Kansas City, 399,746; St. Joseph, 80,935; Springfield, 57,527. Of the State's population (1930) 1,859,119 were urban, or 51.2%; 3,398,887 whites; 230,480 coloured; 3,476,934 native born, or 95.8%; 152,433 foreign born. Principal State officers (1940): governor, Lloyd C. Stark (Democrat); lieutenant-governor, Frank G. Harris; secretary of State, Dwight H. Brown; auditor, Forrest Smith; treasurer, R. W. Winn; attorney-general, Roy S. McKittrick.

History.—The outstanding event of 1939 was the crippling of the powerful Pendergast political machine (Democrat), previously weakened by Federal convictions growing out of the 1936 election frauds. Governor Stark's appeals to President Roosevelt instigated action by the U.S. Treasury and Justice departments, which, following U.S. District Attorney Milligan's efficient prosecutions for income tax evasion, resulted in the imprisonment at Leavenworth of boss Thomas J. Pendergast and four of his henchmen. The State then broke the machine's control over the Kansas City police, and also helped Federal authorities to destroy the machine's influence in the WPA in Missouri. The 60th session of the Missouri General Assembly (Jan. 4-June 24, 1939) remained in session longer than any previous assembly. Voting about \$232,000,000 for various purposes, it appropriated more money than any assembly in the State's history. Its appropriation for general relief was \$6,500,000 (previous biennium \$9,000,000). Among the more important laws enacted were: placing the Kansas City police department under control of a board consisting of the mayor and of four commissioners appointed by the governor; making need the determining factor in granting old-age assistance; lowering old-age assistance eligibility from 70 years to 65 after Dec. 31, 1939; extending the 2% sales tax until Dec. 31, 1941; directing Lincoln university to provide Missouri Negroes "opportunity for training up to the standard furnished" by the University of Missouri.

Education.—For the school year ending June 30, 1939 the public school system consisted of the University of Missouri, Missouri School of Mines and Metallurgy, five State teachers colleges, Lincoln university (Negro), schools for the deaf and blind, Negro Vocational school, approximately 10,000 elementary schools, and 956 high schools. For the same period there were 519,830 pupils and 18,466 teachers in elementary schools, and 192,496 pupils and 7,876 teachers in high schools; total disbursements of the school districts were \$57,875,789.

Charities.—In Dec. 1938 the combined amount of public relief



PAUL B. JOHNSON, elected governor of Mississippi Nov. 7, 1939

expenditures (public assistance, WPA, etc.) was \$7,296,842, an all-time monthly peak, which declined during 1939. In Nov. 1939 old-age assistance for persons 70 or over averaged \$18.94. The unemployment compensation payments for 1939 totalled \$5,464,683. During the same year the Missouri State Employment Service placed 67,022 in private industry (120.5% over 1938) and 13,650 in public employment. The Trachoma hospital at Rolla, completed in 1939, is the only State hospital in the U.S. for the exclusive treatment of trachoma, a principal cause of blindness. The Ellis Fischel State Cancer hospital is (Jan. 1940) near completion at Columbia; it will be the first State cancer hospital in the U.S.

Finance.—The balance in the State treasury on Dec. 31, 1937 was \$24,706,385.44; receipts for 1938, \$88,387,044.20; disbursements 1938, \$91,867,408.54; balance in State treasury Dec. 31, 1938, \$21,226,021.10. The total bonded State indebtedness on Dec. 31, 1938 was \$109,943,000; on Dec. 31, 1939, \$103,255,000.

Agriculture, Manufactures, Mineral Production.—In 1937 Missouri had 202,863 farms with a total acreage of 35,238,370, of which 13,221,740 ac. were devoted to crops and 15,723,000 to pasture. For the same year it ranked fifth among the States in number of hogs on farms, eighth in horses and cattle, ninth in mules, and 11th in sheep; for 1938, seventh in quantity of corn, oats, and grain sorghums produced, eighth in winter wheat, and 11th in tame hay.

In 1935 Missouri ranked tenth among the States in manufacturing on the basis of number of establishments, 11th in value of products, 13th in number of wage-earners, and 12th in amount of wages.

The value of the State's mineral products for 1937 was \$52,446,272. In the same year Missouri's place among the States was first in value of lead and barite produced, second in chats, and third in lime and raw clay. During 1938 Missouri produced 122,027 tons of lead, which was 33.4% of the total output in the U.S. and 6.5% of the world's production. (R. P. Br.)

Mohammedanism: see ISLAM.

Molotov, Vyacheslav Mikhailovich

(1890—), Russian statesman, was educated at Petersburg Polytechnic and during his youth organized Bolshevik student groups and worked for the newspaper *Pravda*. February of 1917 found him a member of the Petrograd Soviet executive committee. He also served on the military-revolutionary committee of the Soviets and during the next two years held party posts at Petrograd and Nijni-Novgorod. In 1920 he was appointed secretary of the central committee of the Communist Party of the Ukraine, and in the following year he held this office for the whole of the U.S.S.R. After occupying high offices in the Russian Politbureau and Comintern he was appointed in 1930 president of the Soviet of People's Commissars. He continued to hold the office of premier when, on May 3, 1939, it was announced that he would succeed Maxim Litvinov as foreign commissar. This appointment foreshadowed a radical shift in Soviet foreign policy, but few were prepared to prophesy that it would culminate in the Nazi-Soviet pact of non-aggression that surprised the world in August. Sitting at the side of Stalin and German Foreign Minister von Ribbentrop, Molotov signed the pact early August 24 at Moscow. At the session of the Supreme Soviet which ratified the treaty seven days later, Molotov explained that Russia had decided not to enter a military alliance with Great Britain and France because, among other reasons, the British had backed up Poland's refusal to allow Soviet troops on Polish soil. A period of furious diplomatic activity for Molotov followed the outbreak of war. (See UNION OF SOVIET SOCIALIST REPUBLICS.)

Molybdenum. The United States is the foremost producer of molybdenum, with about 86% of the world's recorded production to date, and a current output of about 92% of the total. Australia, Chosen, Japan, Spain, and Sweden have contributed in the past, but are no longer active; Norway has long been a producer, but contributes only 3% of the current output, while Mexico, which first produced in 1932, now supplies 3%; Morocco, beginning in 1933, now adds another 1%, and various smaller producers the same amount, making a total of 16,337 metric tons in 1938 against 14,250 tons in 1937. An output of 2,200 tons in 1929 declined to 1,280 tons in 1932, but new developments in the applications of molybdenum in alloy steels and cast iron have resulted in a demand which has increased the 1932 low by nearly thirteenfold in six years. (G. A. Ro.)

Monaco. A principality on the Mediterranean coast, bounded on the land side by French territory. Area 375 ac. (0.59 sq.mi.); pop. (est. 1938), 22,994. Chief towns: Monaco, La Condamine, Monte Carlo; ruler: Prince Louis II; language: French. The chief occupation is catering for visitors, who number more than 2,000,000 annually, and the revenue is wholly provided by the Casino.

Monazite. Formerly in demand as a source of thorium for incandescent gas mantles, monazite declined in output as electric lighting supplanted gas, and for a time production almost ceased. Later, demand was renewed, to furnish cerium for pyrophoric alloys, and recently has been increased by the use of thorium in radio tubes. The bulk of the world output comes from Travancore, in India, 5,220 long tons being reported for 1938. Brazil was formerly the leading producer, but dropped from the market when Travancore began to increase heavily; Brazilian shipments were revived in 1937, with 424 metric tons. Netherlands East Indies, a new producer, supplied 668 metric tons in 1937 and 370 tons in 1938. United States imports vary widely from year to year, averaging about 600 short tons. (G. A. Ro.)

Mondell, Frank Wheeler (1860–1939), U.S. legislator, was born at St. Louis on November 6 and was educated in public schools and by private tutors. In 1887 he moved to Wyoming to prospect for coal and later became manager of a mine there. He was mayor of Newcastle, Wyo. from 1888 to 1895, president of the senate in 1892, and assistant commissioner of the General Land office from 1897 to 1899. He was first elected to the U.S. House of Representatives in 1895. Elected again on the Republican ballot in 1899 he was a member of the 56th to 67th Congresses inclusive (1899–1923) and was majority floor leader of the 66th and 67th. Mondell was the author of *My Story*. He died August 6 at Washington, D. C.

Monetary Units of Leading Countries: see EXCHANGE RATES.

Mongolia (INNER AND OUTER), is a vast sparsely populated tableland occupying about 1,000,000 sq.mi. in North-eastern Asia. It is bounded on the north by Siberia, on the west by Chinese Turkestan, on the east by Manchoukuo, on the south by China Proper. Of the two component parts of Mongolia, Outer Mongolia (622,744 sq.mi.) is greater in extent; but Inner Mongolia (334,100 sq.mi.), understanding by that term the three Chinese provinces of Chahar, Suiyuan and Ningsia, is more thickly populated. The population of Outer Mongolia is usually estimated at 750,000–800,000, while there are about 1,500,000 Mongols in Inner Mongolia. Mongols constitute the majority of the population in those provinces of Manchoukuo which lie west of the

Hsingan mountains and in the Soviet Republic of Buriat-Mongolia and some of them are to be found in Chinese Turkestan. They are mostly a nomadic and pastoral people, although in regions where they have mixed with the Chinese they show some tendency to adopt a settled agricultural life. Their unit of social organization is the tribe, or banner.

Lamaism, a somewhat corrupted form of Buddhism, is the dominant religion; and Lamas, or priests, constitute a considerable part of the population.

History: Inner Mongolia.—A feature of life in Inner Mongolia has been the rapid development of Chinese colonization, especially along the line of the Peiping-Suiyuan railway. This led to much friction between the Chinese agriculturists, who wished to settle on the land, and the nomadic Mongols, who desired to keep large open spaces for the pasturing of their flocks and herds. There were occasional Mongol riots and revolts; but the Chinese officials, on the whole, maintained the upper hand until a new factor entered into the situation as a result of the creation of Manchoukuo. Japanese military influence began to spread from Manchoukuo into Inner Mongolia and the Japanese took advantage of the antagonism between the Mongols and the Chinese.

A so-called Mongolian Autonomous Political Council, with headquarters in Pailingmiao, came into existence under the leadership of Prince Teh, a Chahar Mongol. Prince Teh's policy was to hold the balance between Japan and China, endeavouring to obtain the maximum degree of Mongolian autonomy; but his hand was largely forced by the sweeping Japanese advance into North China in the summer of 1937. The Japanese had already obtained an adherent in Li Shou-hsin, a Manchoukuo Mongol who commanded an irregular force which had taken over several counties of Chahar in the winter of 1935-36. Mongol cavalry co-operated with the Japanese in their advance to Paotow, railhead of the Peiping-Suiyuan railway. At the end of Oct. 1937 an Autonomous Government of Mongolia was formed, headed by Prince Yun, a leader of the Suiyuan Mongols, with Prince Teh as vice-chief of State. The territory of the new State provisionally includes Suiyuan, and the northern part of Chahar. It is provided with Japanese military and political advisers. After the death of Prince Yun, in April 1938, Prince Teh became head of the Inner Mongolian Government. Because of racial, economic, and geographical conditions two other autonomous regimes, loosely linked up with the Inner Mongolia regime, have been set up, with headquarters at Tatung, in North Shansi, and at Kalgan, in South Chahar.

History: Outer Mongolia.—The Republic of Outer Mongolia came into existence as a result of the invasion of this region by Soviet troops waging war against the White leader, Baron Ungern-Sternberg, who had made Outer Mongolia a base of operations. With this Soviet aid a group of Mongolian revolutionaries established themselves in power; and since 1921, when the so-called People's Revolutionary Government was established in Urga (now renamed Ulan Bator), the capital of Outer Mongolia, that territory has been in very close relations with the Soviet Union.

The Government of Outer Mongolia endeavoured to push through a regime of agricultural collectivization on Russian models, and this led to much discontent and several revolts between 1929 and 1932. Subsequently this effort was considerably modified and internal conditions in the country during recent years seem to have been more settled. There has been sporadic border fighting with Japanese and Manchoukuo troops in the Lake Buir region, along the eastern frontier of Outer Mongolia. While the country is still overwhelmingly pastoral in character there has been a slight development of coal mines not far from the capital, Ulan Bator, and a small railway was built to facilitate development of these mines, while a highway was constructed between Ulan Bator and the Soviet frontier town of Kiakhta.

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Mono Craters Tunnel: see AQUEDUCTS.

Montana, a Northwestern State of the United States admitted Nov. 8, 1889, popularly known as the "Treasure State"; area 146,572 sq.mi. (third largest in the Union); population according to the U.S. census of 1930, 537,606, estimated by the Census Bureau July 1, 1937, 539,000. Capital, Helena, 11,803, which is the fifth city in size in the State. Larger cities (with their 1930 population) are: Butte, 39,532; Great Falls, 28,822; Billings, 16,380 and Missoula, 14,657. Of the State's population in 1930, about 33% or 181,036 were urban; 517,327 were whites of whom 444,366 were native born; 14,798 were Indians. According to the Indian Service there were 16,341 Indians in Montana in 1938. There were 216,479 gainful workers in 1930. Of these 79,518 were engaged in agriculture, 14,952 in mining, and 33,618 in manufacturing.

History.—Politics centre on redistribution of tax burdens, improved working conditions, water conservation and irrigation, and extension of social security. Farm and labour groups control the legislature. Roy E. Ayers was elected governor in 1936, Sam Mitchell, secretary of State, Harrison Freeborne, attorney-general, and Ray N. Shannon, treasurer. In 1938, Jerry J. O'Connell, liberal Democrat, was defeated for re-election to Congress.

Education.—The public schools, with a budget of \$13,000,000 enrol 77,000 pupils in the grades and 33,000 in high schools. The six units of the University of Montana register 5,227 students and have an income of \$1,666,969.

Charities and Correction.—Charities and relief were administered almost entirely by the State Board of Public Welfare and by Federal agencies. The State maintains institutions for orphans, blind, deaf, dumb, insane and tuberculars. It also has reform schools for boys and girls, and a State penitentiary.

Finance.—The public debt of the State amounts to \$11,699,000. The State now operates on a balanced budget with an income in 1939 of \$33,669,000, including \$2,734,000 payroll tax. Net county indebtedness is \$6,973,000. The tax income of the 56 counties is \$9,340,000, mostly from property taxes. City and town indebtedness is \$4,987,000, and their tax income is \$4,000,000. School districts have a net indebtedness of \$8,511,000, and an annual tax income of \$9,600,000. Total tax delinquency in 1939 was \$17,722,000.

Agriculture, Manufactures, Mineral Production.—The State contains 47,400,000 ac. of agricultural and grazing lands (excluding public lands), valued at \$379,000,000. The chief crop is wheat, of which 56,608,000 bu. were raised in 1939. Also produced were 891,000 tons of sugar beets, 2,451,000 tons of hay and 320,000 bu. of apples. Sugar and cereals are important manufactures. On the ranches are 1,016,000 cattle, 3,210,000 sheep and 253,000 horses. The forests contain 50,000,000,000 bd.ft. of standing timber located on 14,613,000 acres. From these, 245,000,000 bd.ft. were cut in 1939. Metal production is valued around \$60,000,000 annually, petroleum at \$15,000,000, and coal at \$4,000,000. Copper is the most valuable metal product, but gold, silver and zinc are important. Smelters at Anaconda, Great Falls and East Helena treat the ore and there are mills for making copper wire and other finished products. Electrical energy amounting annually to 1,500,000,000 kw.hr. furnishes power for factories and railroads.

BIBLIOGRAPHY.—*Montana: A State Guide Book*, Federal Writers Project (1939). (E. E. B.)

Montreal, in the Province of Quebec, Canada, is situated on an island at the confluence of the Ottawa and St. Lawrence rivers, approximately 1,000 mi. from the Atlantic ocean and 2,760 mi. from Liverpool. It is at the head of ocean navigation and the terminus of lake vessels. It is served by three canal systems, the St. Lawrence canals, 1,230 mi. to the Great Lakes, the Eastern United States canals, via the Richelieu river and Lake Champlain, 127 mi., and the Ottawa river canals, 119 miles. The head offices of the Canadian Pacific railway and of the Canadian National railways are situated at Montreal.

Population of the city of Montreal (Federal census, 1931), 810,925, and of greater Montreal, including its suburbs, 973,637. In 1939, as estimated by Lovell's *Directory*, the population was: city of Montreal 1,286,388, greater Montreal 1,471,928. Greater Montreal is governed by a Metropolitan commission, the majority of whose members are appointed by the city council of Montreal. The city council consists of 35 aldermen, of whom 5, selected by the council, comprise the executive committee. The mayor, elected by the city, is not a member of the executive committee.

Control of education is divided between the Catholic School Commission of Montreal and the Montreal Protestant Central School Board. The method of appointing members of the Catholic School Commission of Montreal was modified during 1937. The commission appointed in 1938 to examine and report on the Protestant school situation suggested modifications in the method of appointing members to the Montreal Protestant Central School Board and advised some changes in the curriculum. It also drew attention to the financial aspect of the problem.

The port of Montreal is the largest in Canada. The number of sea-going vessel arrivals in 1939 was 945, having a tonnage of 3,678,281. The number of coastal or inland vessel arrivals in 1939 was 431, having a tonnage of 937,991. The total inward cargo tonnage for 1939 was 9,410,958 and the total outward cargo tonnage 5,388,735. For 1939 the amount of building permits issued stood at (new) 1,151, value \$7,071,161, (repairs) 1,830, value \$2,182,345; bank deposits (for 11 months ended Nov. 30, 1939) \$28,560,485,250, and bank clearings (for 12 months ended Dec. 31, 1939) \$17,125,877,672. The assessed value of real estate was \$1,236,537,229. (J. A. MA.)

Montserrat: see WEST INDIES, BRITISH.

Mooney, Thomas J.: see CALIFORNIA.

Moore, Hugh Kelsea (1872-1939), U.S. chemical engineer, was born January 3 at Andover, Mass. and was educated at Massachusetts Institute of Technology. Among his inventions were a ten-effect multiple effect evaporator, the unsubmerged diaphragm cell, a stationary furnace for recovering soda content from black liquor, and new processes for making calcium arsenate and converting sodium sulphate into caustic soda and other chemicals. He also conducted research in refrigeration, pulp manufacture, hydrogenating oil, and many other related fields. In 1920 he was awarded the gold medal of the American Institute of Chemical Engineers for the "best contributions to applied science since 1913." He was also awarded the Perkin medal in 1925. Moore, who retired from business in 1934, died at Dunedin, Fla., December 18.

Moravia: see BOHEMIA AND MORAVIA.

Mormons (or LATTER DAY SAINTS). During 1939 the church continued to press forward in its welfare work under the plan adopted in April 1936. It has made more effective its productive budgetary plan, under which a survey is first made of the needs of the various ecclesiastical administrative units

as to food, clothing, shelter, and fuel, and then an assignment is made to these various units of the materials which they are expected to produce for the church budget. At the end of the season there is a supervised interchange and exchange of these materials so that the needs of each community are as fully met as possible. For example, grapefruit, oranges, and lemons from Arizona may be exchanged for Idaho potatoes. Coal from eastern Utah coal mines may be exchanged for flour and canned goods from northern Utah. To facilitate this exchange the materials produced are gathered into storehouses, of which there are more than 70 in the church. Each storehouse arranges for the interchange of products in adjacent areas. A central storehouse in Salt Lake City effects exchanges among the different storehouses. A General Church Committee supervises these exchanges.

In the main such materials are produced by voluntary, unpaid labour. The entire male membership of the church over 12 years of age bear the priesthood—there being no ministerial or priestly class in the church. This priesthood is divided into a higher (Melchizedek) and a lower (Aaronic) priesthood, and each of these is subdivided into other groups, which are again divided into sub-groups called quorums. These quorums are the ultimate units involved in the production of materials. (J. R. CL.)

Morocco: see FRENCH COLONIAL EMPIRE.

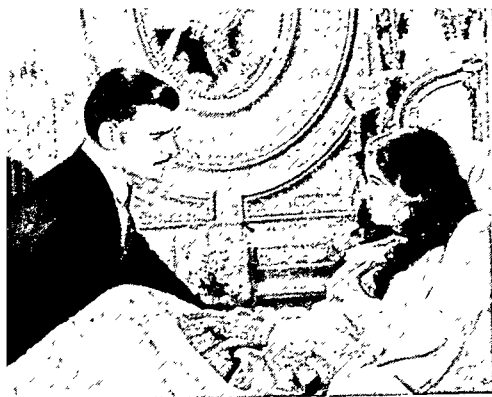
Moscicki, Ignacy (1867-), Polish statesman and scientist, was educated at Riga Polytechnic, where he earned a reputation as a brilliant student of chemistry and electricity. He became a lecturer at Freiburg university in 1897 and was appointed professor of electrochemistry at Lwow Polytechnic in 1912. Among his many discoveries, those made in connection with the oxygenization of nitrogen were his most notable. Moscicki organized the Polish Chemical Research institute and was for a while director of a nitrate compounds factory. Although he was interested in politics he had never held even a minor political post when, as Pilsudski's nominee, he was elected president of Poland in May 1926. Moscicki did not take an active part in the "war of words" which preceded the German invasion of Poland in 1939, except that on August 25, replying to President Roosevelt's joint appeal to Hitler and himself, he declared Poland's willingness to attempt a settlement of its dispute with Germany by direct negotiation, arbitration, or conciliation. Fleeing with his ministers before the rapid German advance, Moscicki crossed the Rumanian border and arrived at Cernauti on September 18 after proclaiming that the Polish Government would continue to function with full authority on foreign soil. Twelve days later he resigned in favour of Wladislaw Raczewicz, who established his Government in Paris. Moscicki left Rumania December 26 for Switzerland to enter a sanatorium.

Mosquito: see ENTOMOLOGY; MALARIA; PUBLIC HEALTH ENGINEERING.

Motion Pictures. The motion picture industry, the invention of Edison, enters its 51st year in 1940 with the greatest economy program ever planned in this lavish business. Labour battles, the European war losses, the annihilation of Japanese and Chinese markets put a drastic economy program into effect.

The investment of \$2,000,000,000, as chronicled in 1938, remains the same, and is distributed in this manner:

Theatres	\$1,880,000,000
Studios	100,000,000
Distribution	20,000,000
	<hr/> \$2,000,000,000



Upper left: CLARK GABLE AND VIVIEN LEIGH in *Gone with the Wind*. The premiere in Atlanta, Ga., Dec. 15, 1939, was an event of national importance. Miss Leigh's acting in this picture won her the 1939 Academy Award

Upper right: NO MEN APPEARED in the cast of *The Women*

Centre left: HENRY FONDA as Lincoln in *Young Mr. Lincoln*

Centre right: SCENE from *Andy Hardy Gets Spring Fever*, released in 1939 as one of a series starring Mickey Rooney (centre)

Above: ROBERT DONAT (right) and Greer Garson in *Good-bye, Mr. Chips*. For this part Mr. Donat received the 1939 Academy Award

Below: JEAN ARTHUR, JAMES STEWART, and Thomas Mitchell in *Mr. Smith Goes to Washington*

Lower right: A NOTABLE TECHNICOLOR PRODUCTION of 1939 was *The Wizard of Oz*



The number regularly employed in the industry in the United States at the end of 1938 was 282,000, and the annual payroll was \$368,560,000. These figures have been greatly reduced during 1939 because of economic necessities due to existing war conditions. Although no definite figures are yet available it is estimated that the losses will not amount to one-third of the revenue, as was at first feared. However, because of the loss of foreign markets each studio has reduced its payroll to meet the lowered income.

With only 31 years of existence in California, this industry has attained world-wide scope. No other business institution boasts such extraordinary growth in one generation. In its influence on human lives it overshadows even its amazing financial triumphs and is seen to take on, more and more, the characteristics of an international service. It mirrors and tends to shape world-wide political developments in an era of strange and tragic tensions.

It has been a most effective instrument for showing world-wide affairs through the newsreels, which took on a new importance in 1939. The Nazi march into Poland, the "Blitzkrieg" of Hitler's armed legions against the outnumbered Poles, the Soviet invasion of Finland, and the preparation of both France and England, as these two nations again declared war against Germany, were among the newsreel subjects of 1939.

These celluloid newspapers also recorded, accurately and entertainingly, the visit of King George VI and Queen Elizabeth to the United States.

As an indication of the good-will influence of motion pictures it is to be recorded that 85,000,000 view the cinema weekly in America, and although the figures, it was first believed, would show a reduction due to the various wars, and only 50,000,000 instead of 150,000,000 others see motion pictures beyond the boundaries of the U.S., it is now estimated that the loss will not be as great as first anticipated.

The top place, accorded the most popular screen player, formerly was occupied by Shirley Temple, an American child of 10, for four years. This position was given in 1939 to Mickey Rooney, a boy of 18. Mickey, in that year, made the most spectacular rise to fame of any motion picture actor.

According to the annual survey of the *Motion Picture Herald*, a trade publication which claims to poll the theatre owners of the United States, Mickey Rooney is named first in popularity at the box office. He is followed in the order named by Tyrone Power, Spencer Tracy, Clark Gable, Shirley Temple, Bette Davis, Alice Faye, Errol Flynn, James Cagney and Sonja Henie.

The most expensive and most widely discussed picture, *Gone With the Wind*, was completed at a cost of \$4,000,000. Statisticians claim it not only will return that amount of money, but make at least \$8,000,000 profit. These figures are based on the early returns of this dramatization of Margaret Mitchell's widely read novel. Vivien Leigh, an English actress, was given an award for the best performance of the year by the New York film critics. Her portrayal of Scarlett O'Hara in *Gone With the Wind* was singled out for this honour. James Stewart was selected by these critics for the outstanding male performance of the year in *Mr. Smith Goes to Washington*.

An adaptation of Emily Brontë's novel, *Wuthering Heights*, produced by Samuel Goldwyn, was chosen by the critics as the best picture of the year. John Ford's direction of *Stagecoach* was awarded first honours.

It is significant that the trend of motion pictures for 1939 was toward American subjects and in glorifying great Americans who have contributed to the sciences and political security of the U.S. Biographies have included *The Life of Alexander Graham Bell* and *Young Mr. Lincoln*, and an ambitious life story of Thomas A. Edison has been planned by Metro-Goldwyn-Mayer.

Gangster, prison, and G-men dramas have kept up their aver-

age. The family series, so popular in 1938, are still leading attractions. The year 1939 saw more remakes of famous plays and pictures than any previous year.

Just as the movies have shown their appreciation of America's great men during 1939, so have they given young America its golden opportunity on the motion picture screen. Many of the outstanding successes were achieved by young people not yet 21.

Before the advent of the European war the Hollywood film studios had mapped out an expansion program with the largest planned expenditure in improvements in the history of motion pictures. More than \$6,000,000 were spent on new constructions, equipment and repairs. Walt Disney commenced work on a new studio in San Fernando valley, California, which will represent an investment of more than \$1,500,000.

The supremacy of the United States in film production remained unchallenged, and the technical skill and entertainment factors developed during the year attained an excellence hitherto unsurpassed. Yet, from a financial standpoint, 1939 was not one of the industry's most profitable years. This condition was attributed, by most informed quarters, to foreign restrictions, quotas, and prohibitive taxes on American films by foreign Governments, particularly the totalitarian States.

The totalitarian States zealously employ imposts, quotas, and provide governmental subsidies to check the importation of foreign films. It is the apparent theory that to shut out alien ideas promotes the acceptance of nationalistic opinions. And because those who live under dictatorships are subtly influenced by the appeal to human emotions—the joys, sorrows, and ambitions that make the whole world kin—the ruling powers fear American films.

The \$2,000,000,000 motion picture industry in the United States for 1939 had an output of 530 feature pictures and 718 short subjects, with an approximate expenditure of \$170,000,000 on production, stories, and talent. The industry has always been forced to rely on sheer entertainment value and artistic merit to maintain its recognized 75% of the world's "screen time." This is because the United States imposes no discriminatory regulations on film imports except a normal tariff rate equal for all.

While the war slowed up the European film production, before the outbreak of hostilities both France and England produced some noteworthy films.

The American companies, at the beginning of 1939, had extensive plans for London productions. One of the finest pictures of the year, *Goodbye, Mr. Chips*, was made in England by Metro-Goldwyn-Mayer, and Robert Donat, the British star, was praised for his fine performance as the school master. Production was greatly cut down for many months but at the close of 1939 conditions were considerably brighter. Noteworthy films produced in England during 1939 were *U-Boat 29*, *The Beachcomber*, *The Challenge*, *The Mikado*, *Edge of the World*, *Four Feathers*, *Jamaica Inn*.

The war brought to an end, temporarily at least, France's most successful year in motion picture production. There was a steady growth in output and excellence of product in spite of heavier taxation, more severe legislation, higher costs and the imminence of war. The general excellence of the French product, both from the standpoint of artistic direction and originality of theme, was exemplified in *Harvest*, *End of a Day*, *Champs Elysees*, *The Puritan* and *Port of Shadows*.

Italian film production lagged behind, in spite of the efforts of the Government-subsidized industry to interest American producers in coming to the film centre, Citta del Cinema. Mussolini announced that 30 American films will be sufficient for the Italian market and states that good American pictures "if maintained in such numbers will not be dangerous for Italian production." Germany and Soviet Russia continued to control motion picture

production virtually 100%, so that most of the films of these nations were nationalistic propaganda.

The cinema industry has maintained in the United States an independence of governmental control that has been the envy of foreign motion picture producers. It has kept itself comparatively free from criticism by self-discipline and control. This autonomy has been attained only after open threats of boycott by moral groups and by censorship in a few States and cities.

Under the direction of Will H. Hays, for 16 years head of the Motion Picture Producers and Distributors of America, Inc., the principal producers have submitted to a voluntary censorship. The most serious criticism of this idealistic scheme is that it sometimes sacrifices artistic integrity to the considerations of security at the box office—but always in the name of public morality.

Since 1937, however, Mr. Hays, who is also an attorney, has been occupied with a more serious task. This is the organization of the defence of the leaders of the industry against a suit to separate the producing interests from those of the distributors. This suit is an action in equity filed by the United States Attorney General in Federal Court at New York. It was brought under the Sherman anti-trust act and alleges the defendants are guilty of forming an illegal monopoly. It is announced that the Department of Justice believed the suit was necessary to restore competitive conditions in the industry.

To this suit, Hays replied with a statement that the motion picture producers and distributors would welcome the prospect of a fair and conclusive endeavour to clarify the application of the existing laws to the trade customs inherent in the development of the motion picture industry. He pointed out that the relationship between producers and consumers of motion picture entertainment is better today than ever before, adding the hope that "judicial clarification would dispel the fog of uncertainty regarding some customs that have grown up in the distribution of a film product involving 12,000,000 transactions every year."

The year 1939 was the most turbulent in the history of motion pictures so far as labour troubles were concerned. Strike threats, hearings before the National Labor Relations Board and intra-union fights, involved long and expensive litigation. A jurisdictional fight between the Screen Actors' Guild and the International Alliance of Theatrical Stage Employees, with the Screen Actors' Guild winning, was one of the significant battles of the year.

Another controversy was that of the United Studio Technicians Guild who fought to control 5,000 IATSE employees, but was defeated. There was a revival of demands for recognition by the Screen Writers' Guild under their own terms. A strike, involving all the A.F. of L. employees in the studios, and the projectionists throughout the United States, was averted at the last moment, by the granting of a 10% salary increase. A promise was made that negotiations could be reopened in Feb. 1940.

In 1939 the studios spent \$1,739,000 for motion picture scripts. Of this amount 22 books were purchased at a total cost of \$728,000 and 18 plays at \$1,011,000, with future royalties still to be computed. While the producers in 1939 did not neglect the time-tested formulae that usually spell success, they did keep away, largely, from costume pictures and musicals. *Broadway Melody*, *Babes in Arms* and *The Great Victor Herbert* were the few successful musical films and their success points toward the production of a greater number during 1940. *If I Were King*, *The Private Lives of Elizabeth and Essex*, and *Juarez* topped the meagre list of costume productions.

With *Gulliver's Travels*, *The Wizard of Oz*, already released, and *The Blue Bird*, *Pinocchio* and *1,000,000 B.C.*, *Dr. Cyclops*, and a prehistoric story planned for 1940, fantasy will play an important part in the 1940 output of motion pictures.

Among the most important films of 1939 are *Stanley and Livingstone*, *Gone With the Wind*, *Mr. Smith Goes to Washington*, *Stagecoach*, *Wuthering Heights*, *Dark Victory*, *The Old Maid*, *Juarez*, *Goodbye, Mr. Chips*, *The Rains Came*, *Bachelor Mother*, *Ninotchka*, *Love Affair*, *The Women*, *Each Dawn I Die*, *Drums Along the Mohawk*, *Gunga Din*, *Nurse Edith Cavell*, *Rose of Washington Square*, *Wizard of Oz*, *Young Mr. Lincoln*, and *Life of Alexander Graham Bell*.

Notable, also, was the increased amount of Technicolor productions due to the decided advancement in speed emulsions, economies in lighting, improved processing and a better acquaintance with the necessities of camera, laboratory, and colour.

The awards by the Academy of Motion Picture Arts and Sciences for 1938, were made in March 1939, as follows: Bette Davis, best actress of the year, for her screen performance in *Jezebel*; Spencer Tracy, best actor, for his performance in *Boys' Town*; Walter Brennan, best supporting actor in *Kentucky*; Fay Bainter, best supporting actress, in *Jezebel*; Frank Capra for direction of *You Can't Take It With You*; special awards to Walt Disney for *Ferdinand the Bull* and *Snow White*; special awards to Deanna Durbin and Mickey Rooney for outstanding juvenile performances; award for best screen play and dialogue to George Bernard Shaw for *Pygmalion*; best musical score, Eric Wolfgang Korngold; best musical scoring, Alfred Newman for *Alexander's Ragtime Band*; best original screen play, Dore Schary and Eleanor Griffin for *Boys' Town*; best cinematographer, Joseph Ruttenberg for *The Great Waltz*; and the Irving Thalberg Memorial Award went to Hal Wallis of Warner Brothers for "the most consistently high quality of production achievement."

Hollywood vies with world capitals in the number of newspaper correspondents stationed in the film centre. It is estimated that there are now more than 300 accredited writers sending out news of the motion picture capital. During the year a daily average of more than 100,000 words went out of Hollywood by telegraph and mail.

(L. O. P.)

Technical Developments.—Two developments in photography during the year 1939 have contributed materially to the technical progress of motion picture production. The first of these developments is the 20th Century-Fox silent camera, which is now available to the entire industry. This camera was first designed, and one camera built, early in 1935, and during the intervening time has been in almost constant use in production. The camera operates without any "blimp" covering and at a noise level satisfactory for motion picture sound recording. A full 200° shutter opening contributes to improved photography. During 1939, production of 12 of these cameras was started, and these will be placed in use throughout the industry during the first part of 1940. Motion picture camera technique was greatly advanced during the year 1939 by the use of the new "Metro-Goldwyn-Mayer Flexible Camera Mounting and Crane" which was placed in operation at that studio late in the year. This camera mounting is a small accurately counter-balanced crane, upon which the camera is securely fastened and which by carefully engineered control mechanism permits the camera to be easily moved about the set. The design of the camera mounting, by the use of counter-balances, permits the camera to be freely moved in any direction by the cameramen and in effect the use of this mounting completely frees the camera for any type of desired movement.

With the use of this device, the camera can be panned horizontally or tilted vertically through a 360° arc, without any restrictions. The camera can be placed at any height from a lens height of 11" from the floor to a top height of 16'.

New Films.—The year 1939 brought a further refinement of both negative and positive films used for photography, as well as the introduction of a new fine-grain sound recording stock. This

film makes possible a marked improvement in sound quality by the reduction of ground noise and modulated noise effects. Extensive photo-chemistry research was conducted by the Paramount studio technical organization to determine the negative development formula which would give the necessary low gamma, high density, sound-negative development. The improved results obtained with this film were also furthered by the use of a new mercury vapour light with specially designed optical control equipment. The first two pictures released to theatres using this new stock were the Paramount production *Geronimo* and *The Great Victor Herbert*.

The elimination of grain has always been a major problem to the motion picture industry. Film manufacturers and the various laboratories have co-operated continuously in attempting to reduce graininess. An instrument developed at the California Institute of Technology has recently been placed in use in one of the film manufacturing plants for measuring and determining the graininess of photographic emulsions. For the first time it is now possible to measure and define graininess objectively and the use of this instrument should be of further help in progressing with the reduction in grain in photographic film.

Special Effects Photography.—In the motion picture industry, any type of photography which is not ordinary straight production photography is known as "special effect" photography. During the past few years developments in film available for motion picture production, advancements in photography and laboratory processing, etc., made the use of more and more difficult special effect photography possible.

Equipment for various special effect work was developed as the necessity arose, and to take care of some particular situation. This equipment was usually composed of an assembly of units never originally designed to be combined and worked together. Recognizing this situation, and realizing that the development of a complete special effect process equipment would contribute materially both from an economic standpoint and from a technical and artistic standpoint, the research council of the Academy of Motion Picture Arts and Sciences some time ago commenced a study of this situation which was completed in Feb. 1939 by the issuance of complete specifications for the "ideal" special effect equipment. These specifications included all of the ideas of all of the various studios and for the first time outlined the combined requirements of all of these studios. After the issuance of these specifications, a number of the equipment companies, notably the Bausch and Lomb Optical company, the Mitchell Camera company, the Mole-Richardson Lighting company, the National Carbon company, the Technicolor corporation and Selznick-International studios commenced the co-operative development of the completely new special effect equipment. The completion of this equipment and its use on the production *Gone With The Wind* marked a milestone in the motion picture industry because (1) it represented a complete equipment engineered and designed co-operatively by a number of equipment suppliers, and (2) these companies working together utilized all of the data and information compiled jointly by the potential users of the equipment.

Also in line with the specifications developed by the Academy Research Council, Mole-Richardson engineers, in co-operation with Paramount studio engineers developed a new high power arc lamp for special effect photography which more than doubles the light output available from any previous similar lamp. The following productions produced and released during 1939 utilized special effect photography to a great extent, and this type of photography is considered to have greatly increased their production value: *Gone With The Wind*, *Only Angels Have Wings*, *Private Lives of Elizabeth and Essex*, *The Rains Came*, *Topper Takes a Trip*, *Union Pacific* and *Wizard of Oz*.

The development of several new types of treadmills upon which

the actors are placed in front of the background screen when it becomes necessary to obtain an illusion of movement (as when an actor apparently walks along a street in front of a series of buildings lining that street) has also contributed to the more effective use of special effect photography.

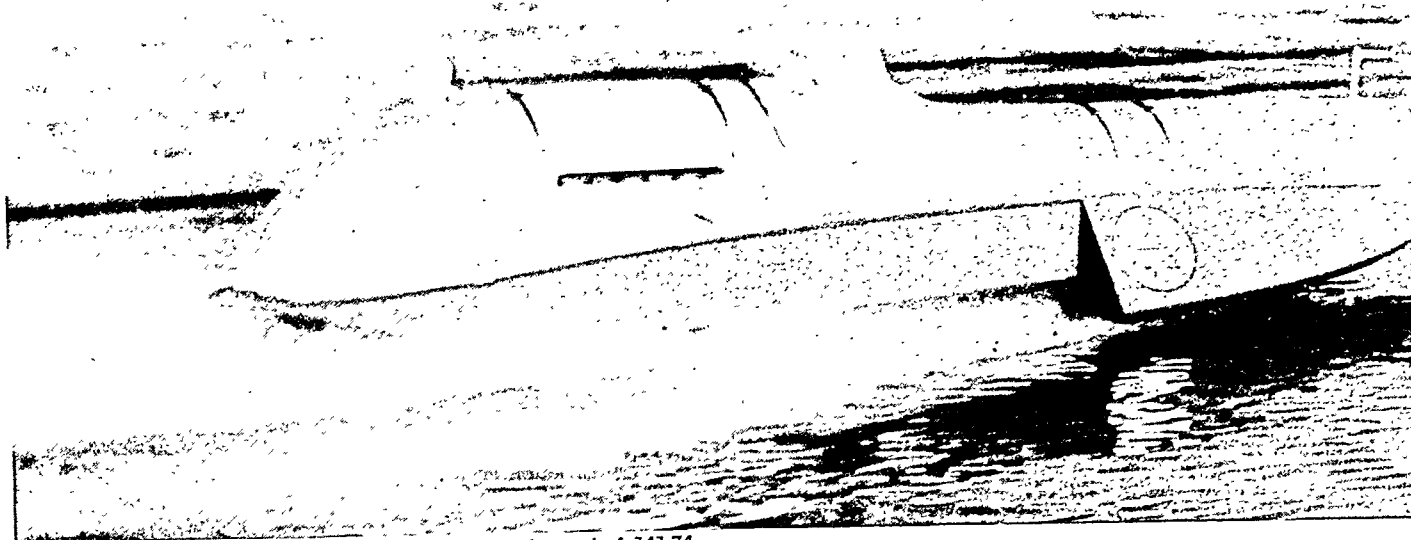
Colour Photography.—A slight increase in the number of colour pictures was made during the year 1939 (18 in 1939, 16 in 1938, 6 in 1937). In addition to these features there were made a great number of short subjects, travelogues and cartoons. The technical advancement of colour photography was furthered by the introduction of a new high speed negative film developed by the Technicolor corporation in co-operation with the engineers of the Eastman Kodak company. The new film permitted a reduction in the amount of light needed to photograph in colour as well as considerably increased the quality of colour photography on the new negative. Advancements in special effect photography in colour during 1939 have removed most of the former restrictions limiting colour photography.

Motion Picture Lighting.—The increasing facility of movement of the camera has necessitated a correspondingly increased freedom of movement in motion picture lighting which has been furthered by the development of a miniature spot lamp. The miniature spot lamp is a small powerful source of light which can be concealed on the set or can be mounted on the camera without upsetting the balance of the camera mounting. The lamp is so small that it can be used on desks behind books, on cafe tables behind menus, or in back of any other small object on the set to give close up lighting without being apparent in the finished picture. A new type of fluorescent lamp exactly matching the quality of daylight, and with a complete absence of glare and negligible heat was recently introduced for use in make-up lighting. Previous lights used in make-up rooms in the studios introduced troublesome colour factors for which corrections had to be taken into account in applying make-up. The use of these new type lamps in a number of the studios has eliminated this problem.

Sound Recording.—The year 1939 found the introduction of an improvement in the recorded quality of motion picture newsreels by the use of "push-pull recording." The RCA Manufacturing company during the year introduced a new light weight push-pull recording system which has found considerable favour with the newsreel technicians. During the year a new light weight exceptionally long "boom," used for hanging the microphone, was introduced by one of the studios which because of its greater efficiency over other type booms has found extensive use particularly for location work where equipment weight is of importance from the standpoint of transportation to and from the studio.

During the year the Warner Brothers studio placed in use a completely new sound track printer which was invented and designed by a member of the studio technical staff. This printer is a considerable improvement over printers previously in use, particularly because of the fact that the "slippage" between the negative and positive has been greatly reduced, and contact between the negative and positive at the point of illumination is such that the reproduced frequency response is better than any previously obtainable from the same negative with other type printers. Printer "weave" has been reduced and the sound track positioning on the film is extremely accurate. The printer has been so designed that full-spectrum or restricted-spectrum (ultra-violet) light may be used, either one of which may be placed in use by an instantaneous selection of filters.

The printer has a number of design features, such as an automatic splice "blooper," a separate optical system for placing clearly printed edge numbers on the film, and other features which are in considerable advancement over the older type printer. One of these printers was placed in use in the studio laboratory during



SIR MALCOLM CAMPBELL set a new world's water speed record of 141.74 m.p.h. Aug. 19, 1939, in his "Bluebird II" on Lake Coniston, England

the year 1939. More will be used. (See also PHOTOGRAPHY: *Motion Picture Photography*.) (G. S. M.)

Motor-Boat Racing.

Although there were few noteworthy developments in either hulls or engines, the attainment of greater perfection in the type already in service and a noticeable increase in reliability, resulted in 19 new speed marks being established by American drivers in the U.S. in 1939. Reliability, too, was the largest single factor in the very creditable showing of Zalmon G. Simmons' "My Sin," winner of America's premier classic, the Gold Cup championship.

"My Sin" was built in 1938 and was thoroughly prepared for the Gold Cup grind at Detroit on Labor Day. In winning she set a new mark of 66.240 m.p.h. for the 90 miles. The President's Cup race at Washington, the only other important event for 12-litre hydroplanes, was also hotly contested and was won by Harold Wilson's "Miss Canada III" after a hard battle throughout the three heats.

The 225 cu.in. hydroplanes continued pre-eminent in the in-board racing field and record-breaking flourished. The veteran Jack Cooper drove his "Tops III" to a one-mile mark of 87.448 miles per hour. "Voodoo," another 225, designed, owned and driven by Chauncey Hamlin, Jr., set a new five-mile standard of 66.176 m.p.h. in the National Sweepstakes Regatta at Red Bank, New Jersey. Other noteworthy marks were set by John L. Hyde's "Gypsy Lass" in the 135 cu.in. class. His figures are 67.479 m.p.h. over a mile course and 52.173 m.p.h. over five miles. Arno Apel set a mile mark of 53.894 m.p.h. in the 91 cu.in. class.

World supremacy on the water, however, still remains in England, for Sir Malcolm Campbell moved his own record farther from the reach of prospective rivals by pushing his "Bluebird II" to 141.74 m.p.h. over a measured mile. (H. L. St.)

Motor Buses: see MOTOR TRANSPORTATION; MOTOR VEHICLES: *Commercial Vehicles*.

Motor Cars: see MOTOR VEHICLES.

Motor Racing: see AUTOMOBILE RACING.

Motor Transportation. Commercial highway transport is America's fastest growing form of public transportation. This applies equally to motor bus passenger operation, and to motor truck freight operation, each of which represents a separate industry in itself.

Buses.—In the motor bus field two main operating groups are involved. These are companies offering intercity or long-haul

service, and those engaged in purely local service within the limits of a single city and its adjoining suburban areas. Intercity carriers, in turn, group roughly into companies operating within the boundaries of one State, known as intrastate carriers, and those crossing State boundaries, known as interstate carriers.

All types of motor bus companies are closely regulated, either by State, Federal or municipal agencies, and in some cases by all three. Interstate highway carriers have been under Federal regulation since 1935. The Motor Carrier Bureau charged with this regulatory responsibility is a division of the Interstate Commerce Commission and governs both motor bus and motor truck operation that is of an interstate character. Intrastate carriers, those operating solely within the boundaries of a State, have long been under the regulation of their respective State governments. In both types of regulations the fundamental provisions are similar and, in general, consist of rules governing insurance requirements, measures designed to promote safety on the highways, a standard accounting classification, the filing of tariffs and compliance with the rates filed in those tariffs. City or local carriers usually are regulated in a somewhat similar manner by the governing bodies of the cities or municipalities in which they operate.

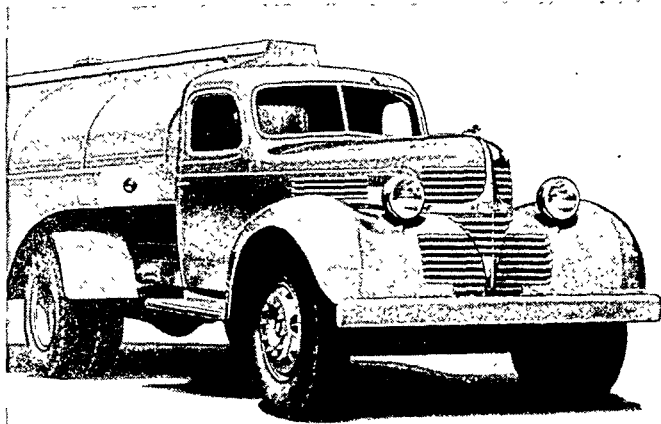
At the close of 1938—the latest year for which statistics are available—there were 4,007 bus operating companies in the United States. Of these, 746 companies were operating in city service, 2,848 in intercity and long-haul service and 413 in sightseeing and other miscellaneous services. These companies jointly owned 51,500 buses, divided 29,200 in city and suburban service, 20,000 in intercity and long-haul service, and 2,300 in sightseeing and other types of common carrier service. Jointly they operated over 385,868mi. of highway, of which 27,812mi. was in city service and 358,056mi. in intercity and long-haul service.

Motor bus revenue for 1938 amounted to \$465,900,000 divided \$222,610,000 for city carriers, \$234,510,000 for intercity carriers, and \$8,830,000 for sightseeing and miscellaneous operation. Passengers carried by buses in 1938 reached the astounding total of 3,965,020,000. Of these 3,249,120,000 were city passengers, 712,390,000 were intercity passengers, and 3,510,000 were sightseers.

One of the most interesting trends is the gradual changeover from railway to bus operation in cities. The records show that close to 600 cities in the United States, having a population of more than 10,000, are now served entirely by buses, a figure which takes on more meaning when we realize that there are only 982 cities in this population group. The electric railways and their subsidiaries now operate approximately 18,000 buses. The steam railroads also have gone in heavily for motor bus operation. Sixty-five railroads operated about 1,800 buses, while in addition many steam railroad companies hold substantial stock ownership in

motor bus operating companies and thus are directly interested in motor bus transportation.

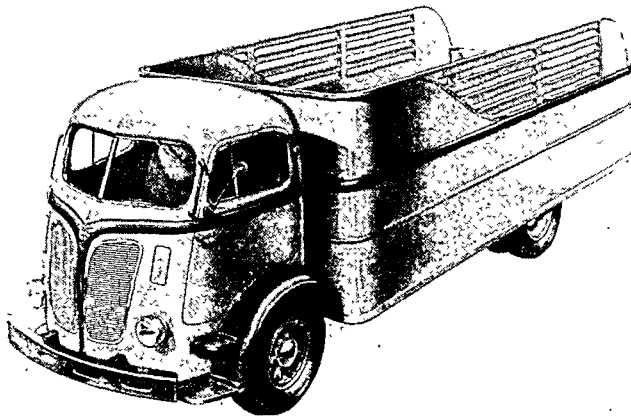
Still another phase of motor bus operation is represented by the school bus field. While school bus operation is not a source of large revenue—since much of the equipment is school owned and the balance operated under relatively low-priced contracts—it does represent a highly important phase of the nation's educational system. Approximately 36,350 schools use buses to carry pupils to and from their classes, utilizing a total of 80,100 buses. In the neighbourhood of 3,400,000 children are carried daily in



DIESEL TRUCK which made trip from New York to San Francisco and return in 1939 in less than 8 days, with a fuel cost of less than a cent a mile



SPECIAL SIGHTSEEING BUS, with elevated seats and high windshield, introduced in 1939



CAB-OVER-ENGINE International truck

this service, at an annual cost to the schools of \$66,000,000. There are approximately 1,225,000 mi. of school bus route.

Trucks.—In size the motor truck field far exceeds the bus field, and there are many ramifications as to the types of service operated. Trucks are used not only by cartage companies in cities and by long distance haulers, but by private businesses as a part of their service to customers. The latest census by the Automobile Manufacturers' Association shows, for instance, that in 1938 there were 997,127 trucks on farms alone. Registrations for 1938 showed that 4,224,031 trucks of all types were licensed during that year.

The large truck fleets are owned mostly by private shippers. The Bell Telephone Company, for instance, operates 16,210 trucks; Standard Oil of New Jersey, 12,000; the Railway Express Agency, 9,960. According to compilations of the Automobile Manufacturers' Association thirty-one private companies operate more than 1,000 trucks apiece, while approximately 1,000 companies operate truck fleets ranging all the way from 100 to 1,000 trucks apiece. These figures do not include tractors, trailers or cars owned by these companies which in many cases equal and often exceed the numbers of motor trucks owned.

Distribution of Motor Truck Fleets by Industries
(Source: Chilton Company)

As of March 1939	Fleets of 8 or More Trucks	
	Fleets Number	Trucks Number
Bakeries, Candies, Florists	1,602	61,601
Bottlers, Breweries	905	18,367
Coal Dealers, Mineral Mines	1,076	19,202
Contractors, Builders	2,981	49,180
Dairy Products, Milk, Ice Cream	1,795	63,107
Department Stores, Furniture	489	12,087
Express, Hauling, Inter & Intra State	5,376	162,095
Flour, Feed, Grains	153	4,243
Government, State, County, Municipal	1,851	230,374
Ice Dealers, Manufacturers	493	14,191
Laundries, Cleaners, Dyers	1,691	34,967
Manufacturers, Steel Mills	789	11,527
Meats, Fish	686	21,057
Newspapers, Publishers	215	5,125
Oil, Gasoline, Greases	1,333	91,631
Paints, Chemicals, Drugs	192	4,397
Public Utilities, Railroads	1,237	74,248
Vegetables, Farmers, Chain Stores	1,535	39,815
Miscellaneous	659	12,283
Totals	25,058	954,302

Railroad use of motor trucks is rapidly expanding. In 1925 a total of only 900 trucks were used in railroad service. By the end of 1938 this had grown to approximately 64,000 trucks in railroad use. This includes terminal transfer service, intercity service, and store-door delivery. Another 200,000 motor trucks are owned by Federal, State and local governmental departments. A highly significant sidelight on the use of motor trucks was offered by a study of the U.S. Bureau of Public Roads which in May 1939 reported that 80% of all trips by motor truck are under 20 mi. in length. According to another Government survey 60% of all common carrier truckers travel less than 100 mi. per trip.

The trucking industry gives employment to more than 3,000,000 drivers, and an uncounted number of freight handlers, mechanics, and helpers. It is closely regulated in every State as to sizes, weights, speeds, and must conform with innumerable other regulations both State and Federal. It pays annually over \$400,000,000 in special truck taxes over and above all regular levies on business, property, and income. Its proudest claim is that it serves 50,000 communities that are not reached by the railroads.

(C. W. S.)

World Trade.—The beginning of 1939 showed that in spite of the fall in world trade in 1938, the growth of motor transport was continued, though the rate of growth was checked, the addition to the number registered (42,756,000) being only 256,000. Though America is still overwhelmingly the greatest of the con-

	Private Cars Taxis '000's	Trucks Buses '000's	Total '000's
United Kingdom	1,916	626	2,542
France	1,750	500	2,250
Germany	1,306	402	1,708
Canada	1,161	220	1,381
Australia	552	252	804
U.S.S.R.	85	593	678
Italy	303	86	389
Union of South Africa	294	45	339

tinents in the field, the percentage of the world total registered in the other continents rose from 25.8% to 26.8%. Outside the United States, the largest numbers are found in the countries shown in the table above. The figures exclude motor cycles, of which large numbers are in use in certain countries—notably Great Britain and Germany. The number in Great Britain has fallen from a peak of 705,000 in 1929 to approximately 400,000 in 1939, owing to the increase in the popularity of the low-powered car.

The early months of 1939 indicated that the growth in 1938 was likely to be at least repeated, but the outbreak of war in Europe reversed the picture. Severe restrictions were placed on the use of motor vehicles, and, while motor transport is being used on an enormous scale for military purposes, the use of private motor cars and public service vehicles has fallen heavily.

The issue of safety on the roads intensified, though the results of the many efforts made to reduce the toll of death and injuries were meagre. About all that can be said is that the growth in motor transport was not causing a further growth in accidents. In one or two cases experiments hold out some hope of a material improvement. In one area in Great Britain motor control police were so effective that deaths were reduced from 303 persons to 248, seriously injured from 1,839 to 1,050, slightly injured from 5,200 to 2,807. This gave a percentage reduction of 44.1 in the persons killed and injured. Unfortunately, to produce such results requires a large staff. Again, the outbreak of war altered the whole position in the countries affected. Fear of attack from the air caused restriction in street lighting and the shading of vehicle headlights. In spite of the reduction in vehicles on the roads, deaths on the roads have doubled—in Great Britain in September and October 2,009 persons were killed, about double the number in the corresponding months of 1938; and the figures for Germany are equally bad. (See also RAILROADS.) (W. T. St.)

Motor Trucks: see MOTOR TRANSPORTATION; MOTOR VEHICLES: *Commercial Vehicles.*

Motor Vehicles. In the United States the 1940 model year began with the New York automobile show in Oct. 1939. There were 21 makes of passenger cars and nine makes of commercial vehicles on exhibit, representing most of the automobile industry. The outbreak of the war in Europe preceded the European shows by a few weeks, and the automobile shows were cancelled in the leading producer countries.

The 1939 motor vehicle production was 33% larger than the previous year. Factory sales amounted to 3,587,000 motor vehicles with a wholesale value of \$2,224,475,000. Total registration climbed to 29,425,000 with 68% of world registration in the United States. Direct employment in automobile, body and parts factories reached 380,000. Export sales amounted to 474,000, or 13% of the output.

The traffic accident rate showed a further small reduction of 2% in the first nine months of 1939. The number killed was 22,240, a saving of 570 lives over the comparable period of 1938. The reduction was due almost entirely to the smaller number of pedestrian fatalities. The automobile industry has spent much of its time in developing the safety features of the new products.

Most speedometers are now marked with safe driving speed zones. Improved brakes, stronger bodies, better vision, new lights and many others are primarily contributions to safety.

Two outstanding developments were offered by most of the automobile industry in the 1940 models, both of them contributing to the safety of the vehicle. The sealed beam headlight was developed by a co-operating group made up of representatives of the State motor vehicle commissioners, safety organizations, electrical manufacturers, and automobile manufacturers. The headlamp consists of a sealed unit replacing the light bulb, reflector and lens. Two types are made, one with glass reflector and glass lens welded into a single unit, the other made up of a sealed assembly of light bulb, metal reflector and lens. The sealed unit protects the reflector from deterioration and assures proper focus of the beam. Either type is interchangeable with the other. In replacing a burned out bulb it is necessary only to aim the beam to have the lamps in proper adjustment. The new lights have an upper and lower beam and are used with a standard foot switch on all cars. The upper beam has an increased intensity for open road driving. The upper beam has a maximum intensity of 75,000 candlepower, an increase from 50,000 candlepower. Practically all passenger car makes and most light trucks carry these lights. Larger batteries and generators have been put on all cars as standard equipment because of the increased drain on the electrical system. Glass insulation is used to increase the generator capacity.

A new sandwich type safety glass was developed by the glass, chemical, and automobile industry and is standard equipment on most 1940 models. An inner layer made of a polyvinylacetyl plastic retains its strength under extremes of cold and has a long life.

Passenger Cars.—The 1940 passenger car bodies are longer, wider, and roomier. Running boards have entirely disappeared on some bodies and many others are offered either with or without them. Windshields and windows are larger with narrower corner posts. This gives better visibility to the driver and passengers. Curved rear windows of safety glass are used on many bodies. More models use foamed-rubber seat cushions. Plastics are used for ornamentation in increased quantities. In opposition to the trend toward larger vehicles there are now three small-size automobiles made.

The appearance of all models has been completely changed. Hoods are broader and lower. Several models have hood catches operated from the drivers' seats. Many additional designs have headlamps, signal lamps and tail lights mounted in the fenders, adding to the smooth appearance of the body. Die-cast radiator grilles are used more widely. Front seats are wider and bodies lower. Several bodies have front seat widths of 60in. which brings the exterior of the body to the full width of the car across the wheels. With the gear shift removed from the floor, this makes it comfortable for three passengers in the front seat. All bodies have better ventilating systems and heaters have been improved. Many cars have heaters under the front seat which heat both front and rear compartments of sedans. Front fenders are more massive and blend into the sides of the body and hood.

Directional signal lights for indicating turns are standard equipment on several models and optional equipment on many more. Flashing lights, both front and rear, are usually used. A suitable switch or buttons mounted conveniently near the steering wheel are used to operate the lights. One model has an automatic switch for turning the lights off after the turn has been completed. In making a turn, front white lights and rear red lights flash on and off to indicate the direction of turn. In addition, telltale lights are used on the instrument panel to indicate the operation of the lights to the driver.

The compression ratio of engines has been increased to take advantage of the higher octane number of gasolines available in 1940. This results in an increase in power output. The petroleum industry now offers several gasolines of 80 octane number or higher. The trend in higher octane fuels is still up. A number of engines are made with compression ratios of over 7 to 1. In several engines a low pressure of 7 lb. per sq. in. is maintained in the cooling system to increase the boiling point of the cooling solution. This allows driving in hotter weather, in mountains and other adverse conditions without boiling away the cooling liquid.

Increased attention has been given to noise and vibration. Body panels are insulated to prevent resonance and the entire body is often insulated from the frame. Mufflers and intake silencers have been redesigned. Unbalance limits on rotating parts have been made smaller. One company has added a final balance operation on the engine assembly line. A new type balancing machine is used to balance the completed engine to a limit of $\frac{3}{8}$ oz. in. before it is assembled into the chassis. This operation is in addition to the balancing of the individual rotating parts during their manufacture.

Transmissions were the subject of much attention in the 1940 models. Practically all cars with gear transmissions now have the shifter lever mounted under the steering wheel. Many shifter mechanisms were redesigned to make shifting easier. A vacuum operated gear shift was continued by one manufacturer. Automatic overdrives are optional on many models. The overdrive is

an economy device since it reduces the engine speed for level road driving. The driver can return to direct drive at will by pressing the accelerator all the way down.

Fluid flywheel drive is more widely used and a fully automatic transmission incorporating a fluid flywheel has been introduced on one model. This automatic transmission does away completely with the clutch pedal and shifter lever for all forward speeds. The accelerator pedal is pushed to go ahead and the brake pedal to stop. A lever under the steering wheel provides for reverse and a high and low range of ratios. For most driving conditions the lever is left in the high range and the control of shifting the planetary gear system is automatic.

*Preliminary Facts and Figures, Motor Industry
For Year 1939*

Production and Value

Car and truck factory sales, U.S. and Canada	3,587,000
Passenger cars	2,892,000
Motor trucks	695,000
Percentage increase over 1938	33%
Wholesale value of cars, U.S. and Canada	\$1,776,151,000
Wholesale value of trucks, U.S. and Canada	\$ 448,324,000
Wholesale value of cars and trucks combined	\$2,224,475,000
Wholesale value of parts, accessories and tires for replacement, and service equipment	\$1,243,236,000
Motor vehicles, accessories, service equipment and replacements of parts and tires	\$3,467,711,000

Registration

Motor vehicles registered in U.S.	29,425,000
Motor cars	25,215,000
Motor trucks	4,210,000
World registration of motor vehicles	43,000,000
Per cent of world's automobiles in U.S.	68%

Taxes

Total motor vehicle user taxes	\$1,601,000,000
Gasoline taxes, federal, state and municipal	\$1,021,000,000
Percentage motor user taxes to all taxes from all sources, federal, state and local	11.4%

Employment

Employment in auto, auto body and parts factories	380,000
Weekly payroll, wages	\$11,796,000

Automobile's Relation to Other Business

Largest purchaser of gasoline, rubber, steel, malleable iron, mohair, lubricating oil, plate glass, nickel, and lead.	
Railroad carloads of automotive freight shipped	3,400,000

Used in Automobile Industry

Rubber	80%
Steel	16%
Lumber, hardwood	2%
Copper	12%
Lead	40%
Zinc	11%
Tin	10%
Aluminium	11%
Nickel	29%
Gasoline	90%
Gasoline used by motor vehicles (gallons)	20,550,000,000
Gasoline used by motor vehicles, retail value including taxes	\$4,009,000,000

Motor Trucks and Buses

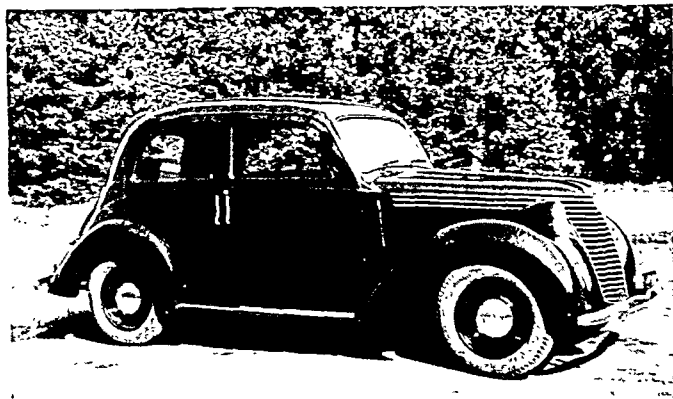
Motor trucks in use	4,210,000
Total special motor truck taxes	\$420,200,000
Fleets of 8 or more trucks (number of operators)	25,058
Trucks operated by fleets of 8 or more	954,302
Number of truck drivers	3,550,000
Motor buses produced	18,000
Motor buses in use	134,000

Sales Outside United States

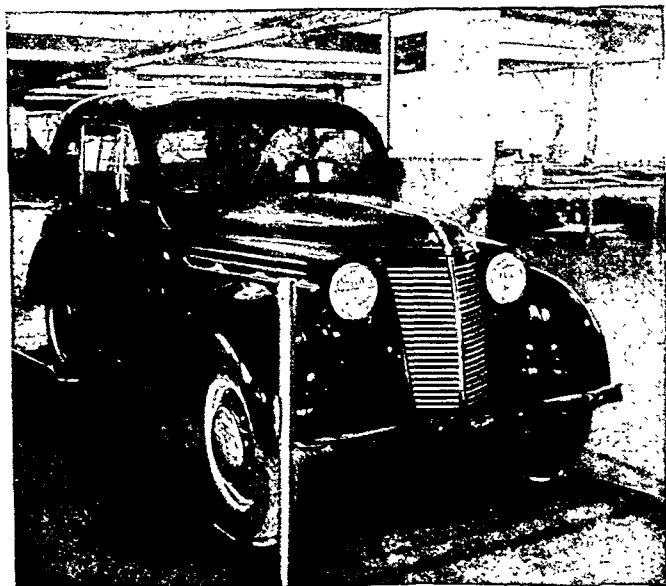
Number motor vehicles sold outside U.S.	474,000
Per cent of production sold outside U.S.	13%
Value of motor vehicles, parts and tires exported from U.S. and Canada	\$312,100,000

Motor Vehicle Retail Business

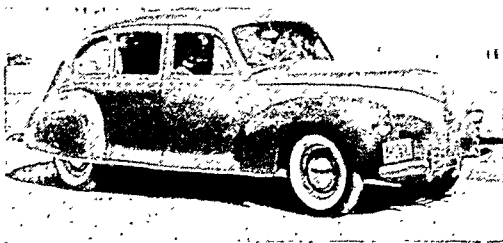
Total car and truck dealers	41,698
Total repair shops	88,929
Total retail outlets, duplications eliminated	95,063
Wholesalers	6,063
Retail gasoline outlets	380,000



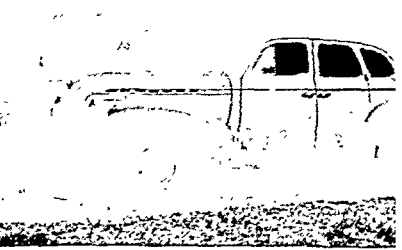
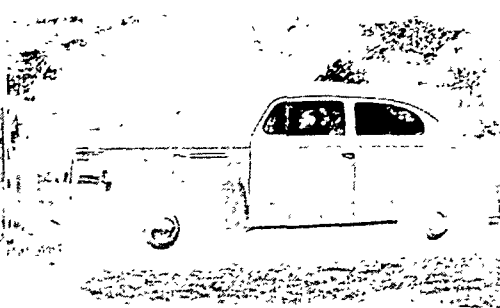
FIAT 4-cylinder, 4-passenger sedan, redesigned in 1939



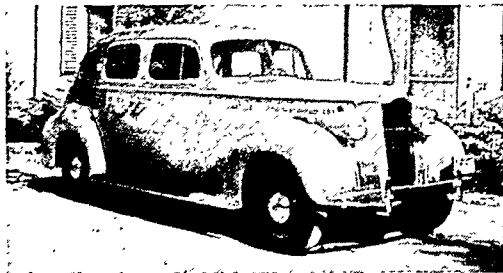
FRENCH RENAULT, on exhibition in 1939 at the New York World's Fair



LINCOLN-ZEPHYR four-door sedan

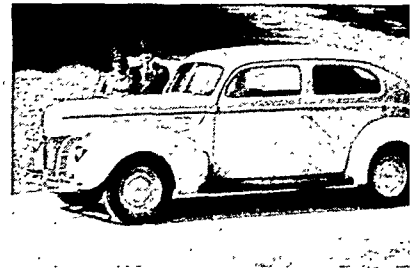
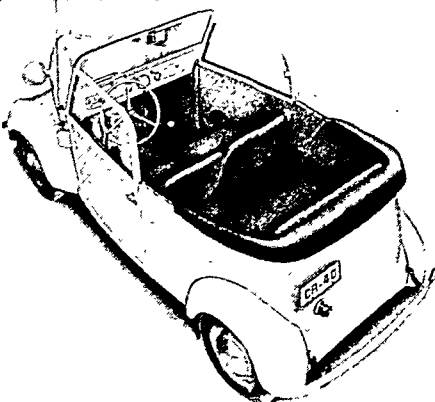


CHEVROLET de luxe sport sedan

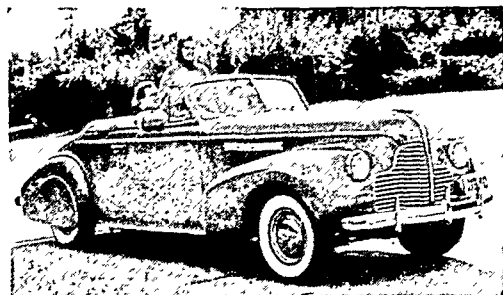


PACKARD 6 "110" for 1940

PLYMOUTH "ROADKING," with 117-inch wheel-base

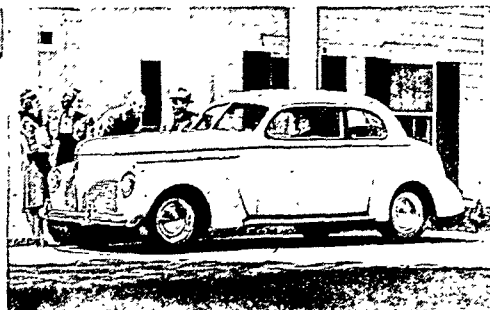


THE 1940 FORD V-8

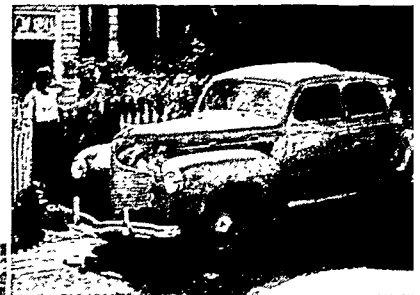


BUICK "CENTURY" convertible coupe for six passengers

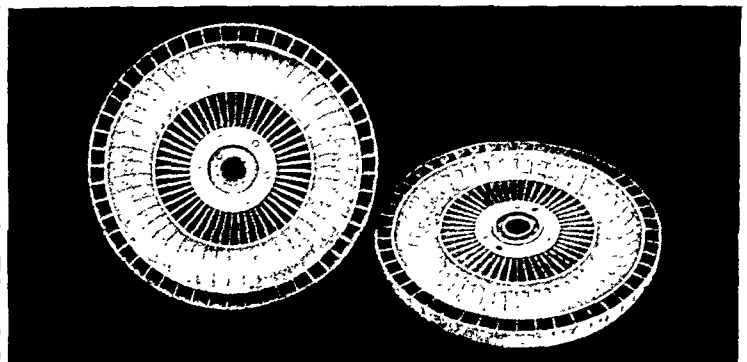
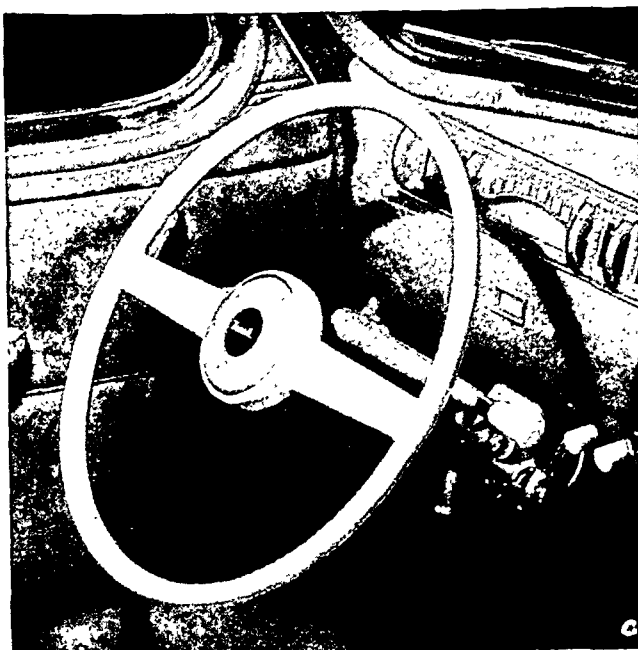
A NEW CAR OF 1939 was the small, two-cylinder Crosley, which weighs only 925 pounds



STUDEBAKER PRESIDENT two-door sedan



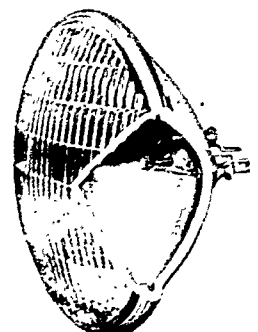
DODGE four-door special sedan



Left: GEARSHIFTS ON THE STEERING COLUMN appeared on most 1940 models

Above: THE "HYDRA-MATIC" DRIVE on the 1940 Oldsmobile eliminates clutch operation; the crankshaft rotor of the "liquid flywheel" transmits power by means of oil thrown against the vanes of the other turbine-like rotor, fastened to the transmission shaft

Right: THE "SEALED BEAM" HEAD-LAMP, filled with an inert gas, was an innovation on 1940 models



Two additional manufacturers have added independent front wheel suspension to all 1940 models. Only a few cars are being built with conventional leaf springs in front. Coil spring rear suspension was continued on several cars. Frames are longer and wider to accommodate the longer wheelbases and larger bodies. One manufacturer has a full ball-bearing worm and nut steering mechanism to make handling easier.

Commercial Vehicles.—The National Truck Show at Chicago in Nov. 1939 opened the 1940 truck model year. A greater attention to body appearance, following the lines of passenger cars, was noted. Trucks vary more in design than passenger vehicles because of the varied nature of the work they do. One air cooled rear engined truck chassis has been developed. Several rear engined buses are offered in the 1940 line. Aluminium was used generally in bus construction.

Hypoid gear rear axles were introduced on light trucks, allowing a reduction in the height of the vehicle. Cab-over-engine models are offered by most manufacturers. This arrangement allows for a maximum of load space for a given wheelbase. Diesel engines, both two- and four-cycle, are installed by several manufacturers in trucks and buses. For large vehicles on heavy schedules the Diesel is becoming more common.

(See also GASOLINE.)

(C. F. KE.)

Mount Holyoke College, pioneer American institution for the higher education of women founded in 1837 by Mary Lyon and situated at South Hadley, Massachusetts. The campus covers 270ac. with over 70 buildings. Registration figures for the 1939-40 session include 1,037 undergraduates and 57 graduate students, a total of 1,094. The teaching faculty numbers 130; the endowment fund as of June 1939 was \$5,264,291; the total college income for the preceding year was \$1,239,661. Gifts received during the year 1938-39 amounted to \$324,729.

(R. G. HA.)

Mozambique: see PORTUGUESE COLONIAL EMPIRE.

Muang Thai: see SIAM.

Multiple Shop: see CHAIN STORES.

Mundelein, George William (1872-1939), American cardinal. One of nine children of an early immigrant family from Germany, he was born July 2 in New York city and showed such an aptitude for study that he received his bachelor's degree from Manhattan college at the age of 16. Declining an appointment to the U.S. Naval academy at Annapolis, he entered St. Vincent seminary at Beatty, Pa., where he completed his theological studies, then went to Rome. Here he enrolled in the Urban College of Propaganda, was awarded a doctorate of divinity and, on June 8, 1895, was ordained a Catholic priest. Upon his return to America he became secretary to Bishop McDonnell of Brooklyn and from 1895 to 1897 was pastor of a Lithuanian church in that city. From 1897 to 1909 he was diocesan chancellor of Brooklyn; in the meantime he had been appointed censor of the Liturgical academy Nov. 14, 1903, and domestic prelate Nov. 21, 1906. His rapid rise in the Catholic hierarchy began Sept. 21, 1909 with his appointment as auxiliary bishop of Brooklyn and titular bishop of Loryma. Six years later, on Nov. 30, 1915, he was made archbishop of Chicago and thus became not only the youngest American priest ever to be made bishop, but the youngest bishop ever to become archbishop. With Patrick Joseph Hayes (who died Sept. 4, 1938) he was summoned to Rome by Pope Pius XI who, at the consistory of March 24, 1924, created the two American churchmen cardinals. Two years later he secured the Eucharistic Congress for Chicago. By that time he had completed the \$13,000,000 Semi-

nary of St. Mary's of the Lake at Mundelein, Ill., a town near Chicago named for him. Cardinal Mundelein died October 2 of coronary thrombosis at his home adjoining the Seminary of St. Mary's of the Lake and was buried on October 6.

Munich Pact: see CZECHO-SLOVAKIA; EUROPEAN WAR; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Municipal Airport of Cleveland: see AIRPORTS: Plan.

Municipal Airport of Newark: see AIRPORTS: Plan.

Municipal Government. Of first importance to municipal Government during 1939 was the rising tide of interest in the vitality of local self-government. The advance in Europe of totalitarian philosophies which dispense with all types of local home rule have served in America to accentuate interest in municipal institutions. This interest is shown not only in local elections, graft clean-ups, the extension of local home rule powers, new municipal charters, the demand for the increased decentralization of relief administration, the opposition to increased central control of education, but also in the statements made by nationally recognized leaders. The words of President Nicholas Murray Butler are worthy of note:

The strength of democracy is measured by the power of local self-government and by the strictness with which limitations set upon distant and central governments are enforced. That people which surrenders local self-government, either from indifference, from inertness, or from a desire to live on someone else's earnings, is on the way out from the temple of democracy.

New emphasis is being thrown upon the meaning of citizenship through the organization of "Citizenship Days" with impressive ceremonies surrounding the induction of voters. The cities of Wisconsin and Illinois have found such programs of value.

Budgets and Prices.—Changes in Federal and State policies have thrown additional burdens upon the cities to finance and administer relief and other local services. The effort to meet this burden in local budgets from current funds and current tax levies has created new financial difficulties in many cities particularly in Ohio, New York, New Jersey, Michigan and New England. The rapid growth of relief needs, together with the increased demands for hospitals and other institutional services, and the new management costs of buildings, boulevards, bridges, parks, playgrounds, highways, sewage systems, water supply systems and other improvements constructed largely by the Federal Government to "make work" are now seen to be upsetting the long established internal balance of local budgets. The first service to feel the pinch has been education, with drastic cuts of school services, as in Ohio and Michigan, and less severe cuts throughout most of the cities of New York State. Those interested in the schools are retaliating by placing their needs before the public more effectively, and are initiating a movement to take the schools completely out of local budgets.

Tax delinquency continues to improve slowly, though 1939 shows little improvement over 1938. There were, however, no significant new defaults on municipal bonds.

The cities are already experiencing slight increases in commodity prices influenced by the war. If hostilities continue throughout 1940, substantial increases are anticipated by city purchasing agents, though no provisions have been made therefor by budget officers. Miscellaneous city revenues have all shown distinct gains especially during the latter half of 1939. The only municipal service thus far generally affected by the war is police. New York city and several other large cities have placed their forces on an emergency basis in co-operation with the Federal Bureau of Investigation of the Department of Justice, extending special protection to steamship piers, foreign consulates, utility plants and other danger spots.

Relief.—Drastic reductions and restrictions by the Federal Government have complicated the relief problem for both the local governments and the States. Congress slashed \$150,000,000 from the President's supplementary appropriation bill for the WPA in the first half of 1939. In June, it reduced the total annual appropriation for WPA by almost one-third as compared with the preceding fiscal year. It also imposed many restrictions, such as the requirement of a 25% State or local contribution, not necessarily a cash one, however; limitation of the cost of building projects; abolition of the prevailing wage policy; abolition of wage differentials in different sections of the United States, except as justified by the differences in costs of living; compulsory 30-day layoffs for those carried on the rolls continuously for 18 months or more; and establishment of a need basis for employment. The effect has been to increase the relief problem for most cities. Particular hardship has been experienced in States where direct relief is left to the local governments. The acute situation in Ohio cities, Toledo and Cleveland in particular, as well as in the rural communities, with respect to the schools and direct relief, attracted nation-wide attention.

Housing.—Low-cost housing received a tremendous impetus through the functioning of the United States Housing Authority. This organization aids local projects through loans and grants. The local authorities bear 10% of the cost of housing projects, besides providing a local subsidy, usually in the form of tax exemption, equal to at least one-fifth of the annual Federal contribution. The number of local housing authorities increased from less than 50 in Dec. 1937, to 250 by the close of 1939. Some 38 States have housing legislation, at least five of which were added in 1939. The legality of State housing authority acts has been uniformly upheld by the courts. New York State implemented its constitutional housing amendment by a public housing law authorizing State borrowing and re-lending to local housing authorities and providing for annual subsidies to help liquidate the loans it makes. New York city inaugurated the first housing program financed entirely by a municipality, through a special city tax on the occupancy of rented business property. The proceeds of the tax are used to liquidate the bonds of the authority over a period of years. A notable study of housing demand is found in a report by Homer Hoyt and L. Durward to the Federal Housing Administration, entitled "The Housing Demand of Workers in Manhattan." There were many new laws enabling local Governments to contract with one another or with State agencies for the performance of numerous public services, such as airport building, police and fire protection, highway construction and personnel administration. Such co-operative service is now most highly developed in California, Michigan and New York.

The documentary film *The City*, sponsored by the American Institute of Planners and shown daily at the World's Fair in the New York City building, was but one of many new steps for bringing local affairs to the attention of citizens and visitors. Among these was the installation of a new Information Center in New York city. Reports from city planning commissions indicate that planning has passed from the "city beautiful" stage and is now equally concerned with the economics of urban development. It is particularly significant that there is open discussion of the danger of zoning too large a frontage for business development in view of current population trends.

There were extensive activities in public service training for both local and State employees in various parts of the U.S. The State Education Department of New York adopted regulations relating to the approval of in-service training courses and the granting of certificates. In New York State alone 20,469 public servants attended training courses in 1939.

The downward trend in the number of traffic deaths continued

throughout 1939, despite an increase in highway traffic. Automobile thefts showed a drop of 5.2%, though other major crimes showed a similar increase, murders rising by 4.6%. (L. Gu.)

Munitions of War.

During the first three weeks of Sept. 1939, German forces aggregating approximately 1,000,000 men put to utter rout the entire military machine of a nation of 30,000,000. And although the latter counted only two-thirds as many effectives (regular army) as the former, available reserves, if employed, as they presumably were, just about reversed this ratio—in favour of the defender. The Poleś, brave soldiers all, were fighting for home and fatherland with the courage of desperation. Why then such swift and overwhelming defeat?

Military experts ascribe two causes for the debacle, viz: (a) Inept Polish strategy, and (according to most observers, much the more important) (b) Insufficient equipment in all modern munitions.

As an example of such insufficiency, it is recorded that of the 70 to 80 German divisions in the field, six were fully mechanized, and four more, motorized, while no comparable units existed among the 40 to 60 Polish (regular) divisions engaged, and obviously none among the reserves. Further, each German division boasted 72 anti-tank, and 12 anti-aircraft guns, as against 18 and 4 respectively for similar Polish commands, while in the air, Germany was prepared to crush Poland's 800 to 1,000 planes with some 8,600 of her own. Reviewing these figures we arrive at the following ratios:

	Men	Anti-tank guns	Anti-aircraft guns	Aeroplanes
Germany	1 (Approx.)	4	3	10
Poland	1	1	1	1

Other things, then, being equal, it would appear that the nation possessing the largest number of ultra-modern munitions is likely to achieve victory in military operations of today.

Hordes of men and masses of modern weapons do not necessarily, however, spell success. Other factors, such as morale and leadership, must receive consideration. Witness the failure of the Russians, most of whose older and abler officers had been "purged" in recent years, to crush, despite overwhelming superiority in men and munitions, the stout Finns in the undeclared war which they initiated in the late fall.

Other things being equal, the quality and quantity of the munitions possessed by one side or the other may readily be the deciding factor. To achieve superiority in these elements is, however, not as simple as it may sound. Indeed the mere acquisition of the very minimum sufficient to the demands of a major military offensive, or defensive, cannot be assured unless:

(1) The numbers required have actually been fabricated and issued to troops, or placed in storage, prior to the commencement of hostilities, or

(a) adequate stocks of all the raw materials entering into their composition, the sources of which lie without the nation's borders and the supply of which is likely to be disrupted or severed when operations commence, have been purchased and actually received, and

(b) necessary provisions made to assure the rapid and uninterrupted conversion of these into the finished product as soon as any indication for this arises.

Obviously, the first answer appears the simpler. In reality, the solution lies between the two. For it is difficult to estimate very long beforehand, either as to type or quantity, the exact requirements, in munitions, for the conduct of a major military operation. Thus, had the United States, at the termination of the World War (1914-18) determined to manufacture and issue or store all of the items of munitions required by an army of, say, 4,000,000, over a period of one, two, three, or four years of active campaigning, and been prepared to spend the billions which such an effort demanded, it would now have available a supply of these sufficient for the arming of a force much larger than it is likely to assemble for a long time to come. But the

majority of these would be obsolete, or obsolescent. Ammunition would in large measure have become unserviceable and require replacement. Gas masks would long since have deteriorated. Guns would be inferior in range and mobility as compared with types recently developed. And imagine a few thousand tanks, or aeroplanes, of the vintage of 1918 being uncased and assembled for active service, anno Domini 1940!

Not only do weapon types change over such a period, but likewise the proportions in which they are employed. Thus the tank, anti-tank gun, and the infantry mortar have not only undergone tremendous improvement since 1918, but the quotas of those issued per tactical unit have been multiplied by several hundred percent. The same holds for aircraft, anti-aircraft armament, and, at least so far as numbers are concerned, for machine guns, though changes in the last-named have scarcely been as revolutionary as in the other varieties. Thus a supply of any of these weapons adequate to the requirements of an army of 4,000,000 in 1918 would be woefully inadequate in a war of tomorrow.

On the other hand, the purchase and storage of stocks of raw materials vital to the fabrication of munitions, but not produced, or inadequately produced, within the homeland, and hence likely to become unavailable or insufficiently available after hostilities commence, is but the beginning of an answer to the problem. For it has been learned by sad experience that the period required by manufacturers not previously trained in their production to convert these into finished munitions varies, no matter how modern their plants and skilled their operatives, from a number of months to considerably more than a year, during which an active and fully armed aggressor can wreak unending havoc. Nevertheless, it remains an important, indeed an absolutely essential, beginning; for lacking such reserve stocks a suddenly established blockade can instantly and completely shut off all further supplies. Hence the active efforts now being made, and made for years past by all major nations doubtful of the security of their naval lanes, to acquire such stocks against the day of need. Even the United States, finally awakened to the necessity for speedy and comprehensive action in this direction, has now undertaken active steps toward the procurement of many vital raw materials in quantities of considerable magnitude.

But this is only the beginning. The building of many types of munitions is an art in itself—one not practised in time of peace save in a few Government arsenals operating with skeleton staffs. And even when fully staffed, and working under the stimulus of wartime conditions, these are unable to supply more than a minute fraction of the total requirements. As already indicated civilian manufacturing plants, having no demand for such products, lack experience in the art and must acquire this before they can, when the tocsin sounds, turn out such items in the quantity and quality which the exigencies of war demand.

So, in addition to the raw materials, it becomes necessary to educate, at the Government's expense, a selected group of such civilian producers in the fabrication of the finished products, not after hostilities commence, but before. Not until the executive and operating staffs of enough of these have been trained in the accurate and speedy construction of the most essential items of an army's equipment and are prepared to convert their plants, practically overnight, from the production of instruments of peace, to those of war, may a nation, in these parlous times, breathe easily. Even then, it dare not lessen for an instant such efforts toward its military security.

Thus, in the last analysis, this security depends upon:

(1) The organization, thorough arming (with the most modern weapons) and training of a force (regular and reserve) sufficiently numerous to ensure the successful defence of the State if suddenly attacked by a major opponent, until it can adequately be reinforced through the usual channels of voluntary service and conscription.

(2) The laying up of reserves of raw materials sufficient to a major military effort of one to four years.

(3) The education of civilian manufacturers in the fabrication of products strictly military in character and not ordinarily produced in time of peace.

(4) The advance preparation of an elaborate and comprehensive plan which will ensure that the thousands of factories whose facilities will be required in a war effort will be in a position to commence their conversion toward the objectives of such an effort within 24 hours after the bugle sounds.

Passing from the general to the specific in the field of munitions, 1939 witnessed much progress in the perfection of existing types—little by way of innovation. Probably the most exciting development in the latter category was the employment by the Germans against the British of a new sea mine of "magnetic" character. While the details of their make-up and exact mode of operation remain military secrets, best naval opinion seems to hold that their firing mechanism must incorporate a circuit-closing device (for detonation of the priming element) the operation of which is initiated by the near approach of any large object capable of exerting a magnetic influence—such as a steel vessel. Beyond this, all is conjecture, though it is hinted that the British, as a result of careful laboratory studies made on specimens which drifted ashore, have solved the intricacies of their construction.

Since most of the latest improvements in munitions, as now being employed by European contestants, received their preliminary try-outs in the Spanish Civil War, it may prove useful to examine conclusions of military observers as to how successfully, or unsuccessfully, various of these fulfilled their missions. Some of the pronouncements have been as follows:

(1) The anti-tank arm has shown itself capable of coping with any tank attack.

(2) Armoured attacks (*i.e.*, by tanks) must have the support of the other arms—infantry, artillery, aircraft.

(3) Low-flying aircraft can at times be the decisive factor in an engagement, and are almost always able to render service of the utmost value.

(4) Fast-flying planes tend to overreach their targets.

(5) Bombing from the air fails to demoralize civilian populations.

(6) Anti-aircraft artillery performed most efficiently, its moral effect likewise being most noticeable.

(7) Too few tanks were used to answer the question as to whether these can be counted upon in future wars to break up a stalemate. Light types were less effective than heavy models, and even the humble hand grenade was used with some success by infantry against these lumbering juggernauts.

(8) The individual infantry soldier must not be overburdened with loads of ammunition for his accompanying weapons—machine guns, trench mortars, and light cannon.

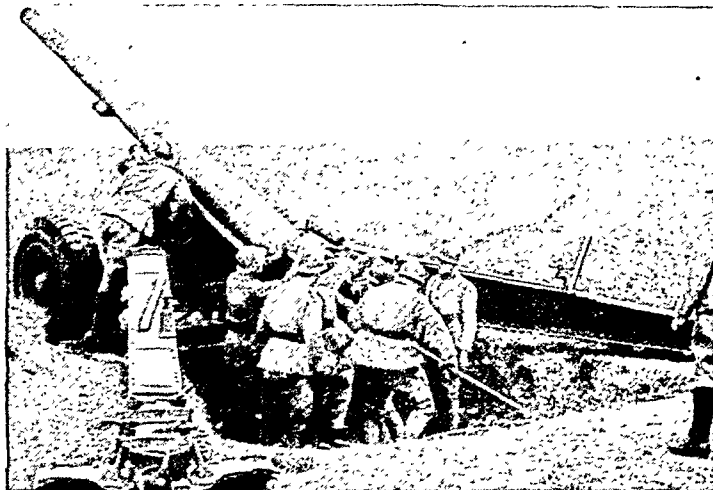
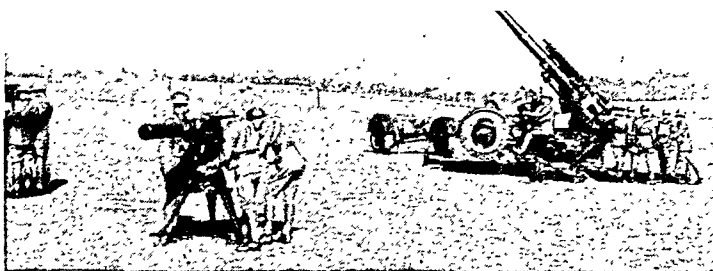
Let us see what weapons actually underwent the test of fire and steel during the Spanish conflict:

Tanks.—The Insurgents employed two general types, viz: The German light tank and the Italian Fiat-Ansaldo tankette. The former weighed $5\frac{1}{2}$ tons, had an overall length of 13ft., a top speed of 30 m.p.h., and carried armour of 0.6" maximum thickness. It was equipped with two machine guns, manned by a crew of two; possessed a rotating turret but no radio.

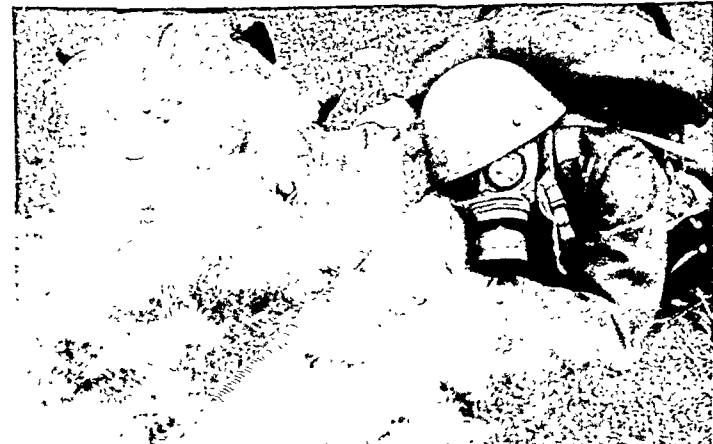
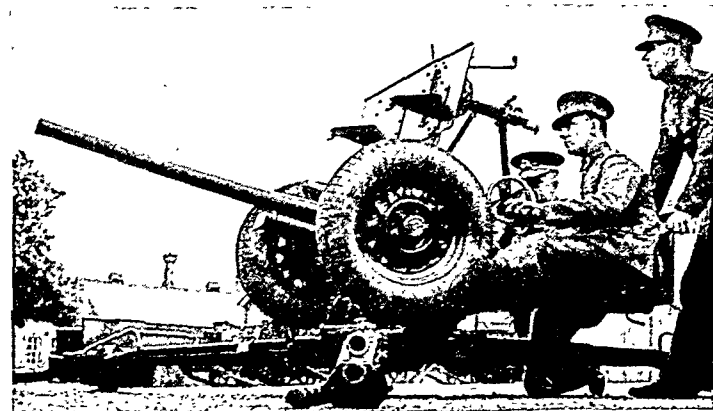
The latter weighed 3.6 tons, was 10ft. long overall with a maximum speed of 27 m.p.h. and armour 0.51" thick. Its weapons were one to two machine guns. The crew again numbered two. It had neither rotating turret nor radio. Against these the Government forces mustered the following varieties: Trubia (light) Spanish, Renault (light) French, T 26 (light) Russian, Christie-Ruski 34 (medium; convertible) Russian, and T 28 (medium) Russian.

These weighed 7, 8, $8\frac{1}{2}$, 14, and 19 tons respectively, with overall lengths to 21.6ft., speeds to 40 m.p.h., and armour from .43" to 1.0" thick. Guns varied from three machine weapons (Trubia) to one 45mm. cannon and 3 machine guns (T 28). Crews ran from two to five or six. All had rotating turrets, and the T 26 and T 28 were occasionally equipped with radio—the rest not.

It thus appears that the Insurgent tank equipment, though speedy, was uniformly too light, and weak in arms, armour, and radio facilities, whereas most of the Government types were reasonably well equipped in these particulars. It is not therefore sur-



Upper left: BRITISH 3.7-IN. ANTI-AIRCRAFT GUN which fires up to heights of 36,000 feet
 Above, left: FRENCH 155-MM. GUN which fires a 95-lb. shell 10 miles
 Above, right: FRENCH 8-MM. HEAVY MACHINE GUN, in position for anti-aircraft fire
 Right: LIGHT FIELD ARTILLERY PIECE of the German army: a 75-mm. howitzer
 Below, left: ANTI-TANK GUN of British army, with effective range of 1,000 yards
 Lower left: BRITISH BREN .303-IN. LIGHT MACHINE GUN, used chiefly for attack
 Lower right: GERMAN 81-MM. TRENCH MORTAR, fired by dropping a bomb into the muzzle



prising that the Insurgents suffered many tank losses, rather is it to be remarked that these were not more extensive.

Anti-tank.—Calibres and varieties of anti-tank weapons included: Hotchkiss (French) 13mm. and 25mm., Oerlikon (Swiss) 20mm., Rheinmetall (German) 37mm., Bofers (Swedish) 40mm., Italian 65mm. infantry cannon. The effectiveness of these was variously estimated as follows: 13mm. (.50 calibre), its solid projectile proved inadequate; 20mm., this piece, weighing but 700-lb. and capable of a rate of fire of 300 rounds per minute, penetrated 1" armour at 500-700yds., and proved highly efficient; 25mm., effective, but of excessive weight (1,760lb.) and low rate of fire (180 rounds per minute); 37mm., opinions differed, some considered rate of fire too slow; effectiveness generally conceded; 40mm., no observations recorded; 65mm., too heavy, and lacking in mobility.

It would appear, then, that while almost any well-designed gun of 20mm. calibre or above can cope successfully with the average tank, those possessing features of light weight and great rapidity of fire proved more satisfactory than such types as lacked these characteristics.

World War figures compared with statistics based on the Spanish conflict, indicate that the percentage of tanks put out of action by gunfire (80-90% of all lost in battle) has increased slightly—from 17% of those engaged in 1918 to 19% in 1939—thus supporting the conclusion already cited: that development in anti-tank defence has closely paralleled that of the tank itself. Considered opinion holds that even greater losses (with a minimum of 25%) must be expected in the future.

Aircraft.—Although enormously improved since the World War, aircraft (when not enjoying great numerical superiority, as in the German invasion of Poland) while occasionally turning the tide of battle, did not prove a decisive factor in military operations. As already noted, constant bombing failed to break civilian morale. Nor, in many instances, did it succeed in disabling objectives of strategic importance. Thus, of 38,000 bombs dropped on the power houses in Barcelona and Sagunto during Spain's 2½ years of Civil War, exactly six made direct hits!

Nevertheless, as a combat arm the aeroplane developed increasing significance, completing the artillery preparation and often closely supporting the infantry attack as well. Even more successfully was it employed in the counterattack, having proved the defender's quickest and most effective means of halting the enemy. Power-diving from great heights to positions 150 to 300ft. above hostile ground troops, ships in groups of 15 to 50 executed short but violent raids, circling above their quarry and harassing him with bombs and machine gun fire. (At 1,000ft., the altitude formerly kept, anti-aircraft fire was effective; at the new low altitudes the enemy became panic-stricken and dashed madly for cover.)

Anti-Aircraft.—Divergent opinions continue to be registered as to the percentage of planes brought down by other ships and by anti-aircraft fire. Thus an excellent authority states that pursuit aviation accounted for nearly 75%, anti-aircraft artillery, 20%, and small arms, 5%, whereas other military experts of high repute attribute to anti-aircraft fire no less than 80% of all plane casualties. Probably both opinions are correct, the discrepancy being due to the fact that, in the first phases of the World War, planes were slower, flew lower, and paid little attention to ground weapons, hence the heavy toll taken by these during that period.

Anti-aircraft guns of small calibre (20mm.) were found highly effective for front line defence, where planes swooped low to attack, but for the security of rear positions subject to bombing from high altitudes those of much larger calibre (e.g., 88mm. or 3.6") proved necessary. Improvements in fire-control systems based on sound ranging were such that creditable reports indi-

cated that no plane would survive 15 successive shots fired at it by an anti-aircraft battery into whose range it flew at an altitude of less than 12,000 feet.

So much for actual trials of munitions in the field. With respect to new or improved methods and devices, or the more efficient applications of older ones, first disclosed to the world in 1939 and yet to stand, over long periods and under all conditions, the acid test of war, we may discuss in turn those applicable to operations on Land, Sea, and Air.

Land Warfare.—Mechanization and motorization received increasing attention from all major military establishments. Thus the British announced, early in 1939, the motorization of three Territorial (National Guard) divisions, each incorporating, among other units a motorcycle battalion and a radio-equipped motorized company of Field Police (to control and direct traffic while on the march), these in augmentation of one partly mechanized division and one mechanized brigade in the regular establishment. France has thus far developed three mobile (partly mechanized) divisions, Italy four. Each of these latter includes in its armament and motor equipment, 148 light and 66 heavy machine guns, 38 minethrowers, 36 field pieces, 30 tanks, 16 armoured reconnaissance vehicles, 400 motorcycles, 650 light, 183 medium and 320 heavy trucks; or about 1,000 motor vehicles all told. The new United States "triangular" division (mechanized and mobile) five of which (four infantry; one cavalry) are in process of organization, has a war strength of 11,500, and is equipped (infantry) with 1,357 motor vehicles as against 1,000 for the old division of almost double its size, though it does not, as yet, embody any tank elements. Even the relatively small Swiss Army entered the year 1939 with 45 motorized batteries of various calibres, their road speeds varying from 9 m.p.h. for the 120mm. gun to 44 m.p.h. for the 105mm., and presumably even more for those of lesser calibre.

Russia announced nine independent mechanized divisions in her regular army, with five more in the reserve. In addition she is said to have somewhere between 25 and 55 combat car regiments of two to three battalions, 13 independent combat car battalions (belonging organically to the infantry division), 12 independent combat car companies, at least five (probably more) completely motorized rifle divisions, and 9 mechanized brigades designed for employment in connection with the larger cavalry organizations for increasing their shock power. In the last-named units, riflemen are transported in fast trucks accompanied by organic artillery. Certain of her mechanized commands have been grouped into three motor-mechanized corps, each of two mechanized and two motorized brigades, and 23 independent brigades of mechanized units and tanks, apart from 13 independent tank battalions. Her total strength in tanks was estimated at 5,000—many of these in special categories (flame-throwers; smoke-emitters, etc.). Disregarding the lessons of the Spanish war, she was sacrificing armour to speed, insisting that the latter offers greater protection than do walls of steel. Thus her heaviest standard tank (36 tons) which mounts one gun of 75mm., two of 37mm., and two machine guns, is capable of 18.6 m.p.h., while her light amphibian (3.2 tons) makes 25 m.p.h. on land and 6.2 in water.

Certain tank authorities foresee the gradual separation of these instruments into three general categories (apart from specialized types), viz:

Accompanying Tanks (light): weighing up to 10 tons, manned by crews of one to three, with 37mm. guns as their heaviest pieces, and a maximum (battlefield) speed of 5-6 m.p.h.; armoured to resist infantry weapons but not anti-tank cannon.

Leading Tanks (medium): heavier and better armoured than the former, with larger crews and more powerful guns, their mission being to open a breach for the smaller types and the infantry. An example is the French "D" tank of 15-17 tons, with minimum armour thickness of 20mm., armed with a 47mm. gun and two machine guns. With a radius of action of 50mi., it possesses a maximum speed of 12 m.p.h., and an average speed

(in action) of 5 miles per hour. Its short wave radio is effective to a distance of 3-6 kilometres.

Special Mission Tanks (Heavy): for attacking anti-tank batteries and hostile tanks. Their weight averaging 20-30 tons, armament includes guns up to 75mm. in calibre. Still heavier types may mount guns of even 155mm. bore, and as many as 8 machine guns. With armour $1\frac{3}{4}$ - $2\frac{1}{2}$ " thick, these can withstand the shell of the 75mm. field gun, but their slow speed and great weight (up to 98 tons) will seriously limit their employment.

Reconnaissance Cars: The French have developed a 60 km.p.h. armoured reconnaissance car with an average speed of 40 km.p.h. and a range of 200 kilometres. It carries a 37mm. gun and two machine guns of alternate calibres. A wheeled vehicle, it weighs $6\frac{1}{2}$ tons and is manned by a crew of five.

For closer reconnaissance there is a 55 km.p.h. car, capable of a cross-country speed of 17 kilometres per hour. It weighs 6 tons, operates on tracks with a crew of two, and mounts two machine guns.

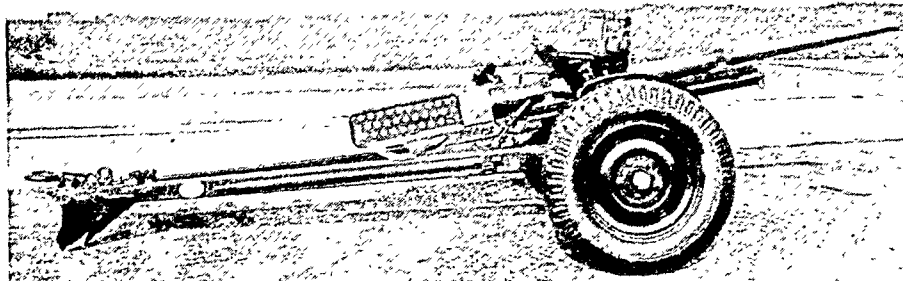
In heavier types we find the armoured combat car of 50 km.p.h. top speed. Its normal road speed is 30 km.p.h., and its cross-country speed, fifteen. Weighing 12 tons, it has a three-man crew which manipulates a 37mm. cannon, and machine guns.

Artillery.—The new 155mm. field gun just developed by the U.S.A. is considered equal or superior to any comparable piece in existence. Weighing 30,765lb., it possesses the remarkable range of 25,000 yards. Capable of high elevation (65 degs.) and all-around traverse, it and the 155mm. corps howitzer handle the

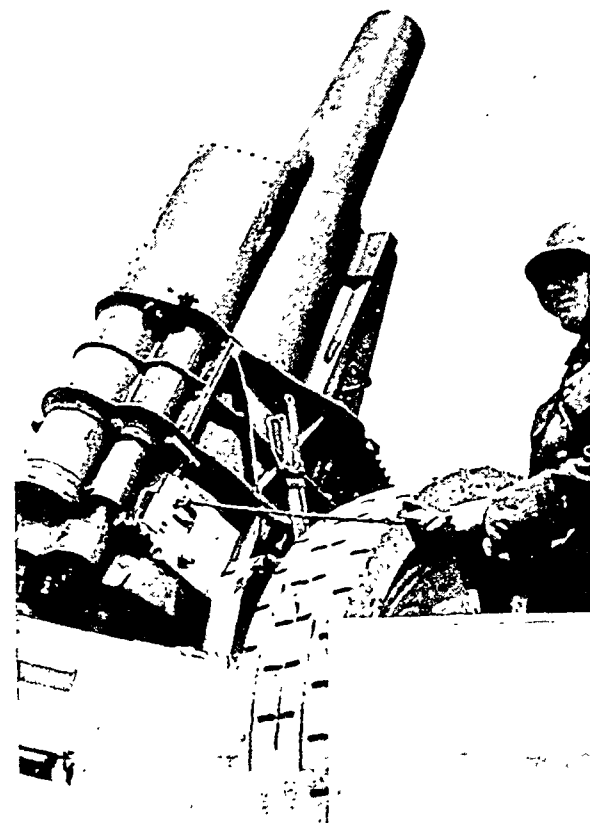
same shell interchangeably. In lighter types, the manufacture of her 37mm. anti-tank weapon, but a single pilot model of which was available in 1938, is now in full swing. This little gun, mounted on a pneumatic-tired carriage with split trail, is capable of wide traverse, and discharges, at a muzzle velocity of 2,600 ft.sec., a projectile capable of penetrating $1\frac{1}{2}$ " of the best armour at 1,000 yards. Light in weight (only 900lb.), it may readily be manoeuvred into position by man power.

Gas.—Though accusations and counter-accusations have been made, there appears to have been no authentic instance of the employment of gas in military or naval operations during 1939. Thus the gloomy prognostications of whole cities being wiped out by toxic gases rained from above show, to date at least, no indication of being fulfilled.

Sea Warfare.—The outcome of the naval battle between the German pocket battleship "Graf Spee" and three British cruisers off the coast of South America in December, astonished a world which up to that time had been convinced that the heavy guns (11") of the "Graf Spee" and other ships of her class would inevitably sink any less strongly armed vessel before it could approach close enough to employ its pieces effectively. (The largest weapon carried by any of the British vessels engaged was of 8" calibre.) The answer to the apparently anomalous outcome

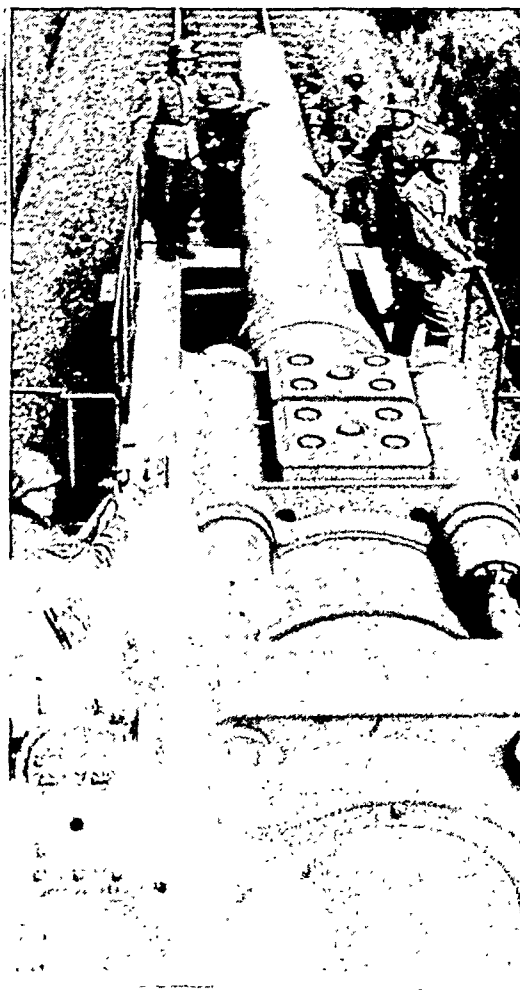


Above: AMERICAN 37-MM. anti-tank gun



Left: GERMAN MORTAR which fires a 240-lb. high-explosive shell

Right: TWELVE-INCH German railway gun, capable of firing a 700-lb. shell 20 miles



Below: THE U.S. ARMY ordered 65,000 Garand semi-automatic, .30-calibre rifles Oct. 10, 1939, as the first step in equipping all infantrymen with this powerful new weapon

of the engagement is yet to be disclosed.

Air Warfare.—As in the case of gas, the myriads of high-explosive and incendiary bombs which the capitals of Europe had expected to descend upon them immediately following the commencement of hostilities, failed in most instances to materialize. True, in those cases where one contestant held overwhelming air superiority (e.g., Germany *v.* Poland, and Russia *v.* Finland), bombing of certain non-military objectives (as in Warsaw and Helsinki) was ruthlessly carried out, with many attendant civilian casualties. But when a strong counterattack could be expected, belligerents let each other's civilian centres severely alone.

Among the agencies of air warfare, planes steadily became faster, more heavily powered and armed, and capable of longer flights from their bases. Speeds now mount to well above 350 m.p.h. (as against about 125 m.p.h. at the termination of the World War, 1914–18) with operating ranges up to 3,750 mi. (350 in 1918).

The Diesel motor continues to receive serious attention in certain quarters. Reinforced plastics (for moulding fuselage and wings) are rapidly coming to the fore, it having been demonstrated that a handful of men can produce, from such materials, either of these structural elements of a plane within a few hours. Though not as yet generally adopted, all portents appear to indicate that, as the wood-and-fabric plane gave way to the all-metal, the latter must now look to its laurels if it is not to be superseded by its plastic rival.

Anti-Aircraft.—Weapons are constantly increasing in calibre and range. Thus the tendency in the British service is toward a minimum calibre of 90 to 100mm., with even 150mm. not entirely out of consideration. (The new aircraft carrier "Ark Royal" mounts anti-aircraft guns of 115mm.) When the bore equals or exceeds 100mm., however, the rate of fire slows to 15–20 rounds per minute, whereas the smaller, fully automatic weapons, can operate at 100 rounds per minute and more. (See also AIR FORCES; ARMIES OF THE WORLD; EUROPEAN WAR; NAVIES OF THE WORLD.)

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Murphy, Frank (1893–), U.S. jurist, was born April 13 at Harbor Beach, Mich. He was made a bachelor of laws by the University of Michigan in 1914 and then continued graduate study at Lincoln's Inn, London, and at Trinity college in Dublin. He practised law in Detroit from 1916 until the United States entered the World War, when he went to France as a first lieutenant and later captain of infantry. After his discharge from the army of occupation in Germany in 1919 he returned to Detroit and was appointed chief assistant to the United States attorney for the eastern district of Michigan. From 1923 to 1930 he was judge of the Recorder's (criminal) court in Detroit, and in 1930 he was elected mayor of the city. Re-elected in 1932, he resigned in May 1933 to accept appointment as governor-general of the Philippines. Reputedly at the suggestion of President Roosevelt he ran for governor of Michigan in 1936 and was elected. During his administration he was widely criticized for not taking action to control the sit-down strikes of 1937 in Michigan, and in 1938 he was defeated for re-election by Frank D. Fitzgerald (*q.v.*). Roosevelt then appointed him U.S. attorney-general to succeed Homer S. Cummings, and he was sworn in to this office on

Jan. 2, 1939. He showed great energy and travelled over the nation throughout 1939 investigating charges of corruption and fraud. Among his successful prosecutions were those of Judge Martin T. Manton of New York and Thomas J. Pendergast of Kansas City. On Jan. 4, 1940 President Roosevelt nominated Mr. Murphy associate justice of the Supreme Court to succeed the late Pierce Butler.

Museum of Modern Art (N.Y.C.): see ART EXHIBITIONS; ART GALLERIES AND ART MUSEUMS.

Museums of Art: see ART GALLERIES AND ART MUSEUMS.

Music. The political situation of the world has vitally affected both composer and performer. The year 1939 has intensified the relation of art to society. It has been a year of political chaos, a year in which the easy relationship of peoples of one culture with those of another has been very nearly stopped. The Spanish civil war of the past few years interrupted the musical life of Spain. Germany's attack upon "cultural bolshevism," upon degenerate music, upon Jewish music led to an exodus, by no means limited to the Jewish race, of established German musicians, weakening unmistakably the musical fecundity of that country. Italy's attack upon the Jew, brought about by the Rome-Berlin Axis, exiled once again more talent of Italy. The year 1938 witnessed the cancellation of Austria as a musical centre; 1939 has seen the cancellation of Czecho-Slovakia, of Poland and of Finland. "Black-outs" and mobilization have for the moment stopped what musical life was left in other centres.

The immediate effect of the political situation is an intensification of what has been occurring for the past decade. Neutral countries, somewhat removed from the strong currents of conflict, become the retreats for an increasing stream of exiles. These countries, still in a position to foster an active musical life, and favoured by the increasing talent that is available for the carrying on of such activity, find themselves taking over the functions that were formerly assumed by the large music centres of Europe. While a review of musical productions for the first part of 1939 must still give space to the activities in London and Paris, that for the last half of the year must shift to Switzerland and other neutral countries of Europe and to the Americas.

The position of the Americas in the musical world is a unique one. While concert life even in Switzerland and other neutral countries has been affected by mobilization and by the uncertainty that comes from too great proximity to the belligerent nations, the American nations, however much their economic life is affected by the world situation, have not as yet felt any curtailment of their cultural activities. Moreover, this shift of the spot light to America comes at a time when the contribution of American composers and performers is being more felt and more recognized, with the result that the situation created is a new and vital one. Exiles have arrived in great numbers in the United States, it is true, and their musical activity is being felt, but the importance of the work that American composers are doing is increasing and the effect is stimulating both to the composers themselves and to American concert life. It is not impossible that in time America will do as much to change the idioms of exiled composers living there, as the exiles will do to effect change in the American idiom.

The usual international festivals of music that occur during the spring and summer took place, and on their programs were heard some works of interest. The 17th Festival of the International Society for Contemporary Music (S.I.M.C.) met in Warsaw in April in spite of the acute political tension at the time. On its programs were few works by the most known modern composers. Either the more established composers do not feel that they should use these programs for the presenting of their new

works or else the international situation was such that they wished not to do so this season.

Of the new works performed some were of real interest. Francis Poulenc's *Messe en Sol-majeur* revealed a new side to that composer's temperament which may mean a great deal in the future of his expression. On the whole the concerts showed once more a movement away from the more extreme methods of expression. Two works, both using with great ingenuity the 12-tone technique, achieved success: a scherzo-finale of a concerto for violin and orchestra by Vladimir Vogel, and *Five Orchestral Pieces* by the English composer Christian Darnton. The 1940 festival of the S.I.M.C. is scheduled for Budapest. Neither the Baden-Baden Festival of Contemporary Music nor the 7th International Festival of Music at Frankfurt were of very great interest. The difficulties in organizing these festivals on an international basis must have been almost insurmountable. To find composers and performers who were willing to appear on these programs and who were acceptable to the Foreign Office must have been a Herculean task. Most of the compositions were by younger German composers, with a few works such as G. Francesco Malipiero's *Hecuba*, a string trio by Jean Rivière, and a ballet, *La Rosière du Village*, by Henri Tomasi, to give the impression of an international scope.

The "Maggio Musicale Fiorentino" established in 1933, though not pretending to be in any way an international festival of music, is nevertheless an occasion of considerable interest. In 1938, Malipiero's ingenious "Dramma per Musica" *Antonio e Cleopatra* was performed. One of the most interesting productions of the festival was Orazio Vecchi's "Madrigal Opera" *L'Amfiparnaso*.

It must be admitted that though the international festivals in Europe in the past may have been truly international in their scope, this was not true of them in 1939. There were, however, festivals of contemporary music in the United States which were broader. The series of concerts by various nationalities presented at the World's Fair of New York might well be termed a festival, and though these concerts presented but few first performances they did present an international viewpoint. The most outstanding concert was that of music by Brazilian composers, in which the music of Villa Lobos had a great success. Three first performances of new English works were well received: Arnold Bax's *Seventh Symphony*, a *Piano Concerto* by Arthur Bliss and *Five Variants on "Dives and Lazarus"* by Vaughan Williams. With one exception no American work appeared on this series of concerts at the World's Fair. This exception was Walter Piston's *Prelude and Fugue*, included by the courtesy of Sir Adrian Boult. (It should be mentioned that the Composer's Forum of the WPA presented an outstanding series of concerts of chamber music by American composers.) It was left to Serge Koussevitzky to present the concerts of American music that might well have been included on this international occasion.

At an American Festival in Boston were presented works of great variety and interest, ranging all the way from Arthur Foote's *Suite for String Orchestra*, Howard Hanson's *Romantic Symphony*, Gershwin's *Concerto in F.*, Randall Thompson's *Second Symphony*, to Roy Harris's *Third Symphony* and an *Overture* by a new young American composer, William Schumann. Such a festival of American music by a major symphony orchestra was truly daring, yet it was accepted as a matter of course, was well received, and was repeated in New York city.

Of the many other festivals of music held in the United States the Berkshire Festival should be specially mentioned, for it is planned to extend this festival with a summer academy somewhat

IGNACY PADEREWSKI began his farewell tour in America Feb. 26, 1939, with a concert broadcast from New York city

on the order of the Salzburg Festival. In conjunction with the usual symphonic concerts there will be a course in conducting under Serge Koussevitzky and courses in composition by Aaron Copland and Paul Hindemith.

The usual repertoire of standard operas continued in spite of the tenseness of the times. With the declaration of war most opera houses in cities that feared bombing were closed, but there were already plans for reopening a few of them. Several new operas of a conventional type were performed. In Italy *Re Lear* by Vito Frazzi was produced at the spring festival in Florence; *Re Hassan* by G. H. Ghedini was staged at the Teatro della Fenice in Venice; and *Il Candelieri* by Ezio Carabella was given in Genoa. In Paris, Henri Sauguet's opera *La Chartreuse de Parma* based on a libretto adapted from Stendhal by Armand Lunel achieved a moderate success. The movement towards a more dramatic yet musically stylized work that dominated the period following the great war may still be followed. Performance during 1939 of Hindemith's *Mathias der Mahler* and Malipiero's *Antonio e Cleopatra* showed that interest in a revitalized form of dramatic expression is not dead. The great success of the former led to its repetition in Switzerland and performance elsewhere. Hindemith's opera *Cardillac* was revived in Zurich. In line with this more progressive thought are also the new works by Darius Milhaud and Arthur Honegger. Milhaud's new opera *Médée* (text by Madeleine Milhaud) had an apparently successful premiere in the Royal Flemish Opera house of Antwerp. Honegger's "Oratorio-Dramatique," *Jeanne d'Arc au Bûcher*, composed to a poem by Paul Claudel, was pronounced on its performance at the Municipal Theatre of Orleans to be his finest achievement since *King David*. Two new works by this composer: *La Danse des Morts*, also to a text by Paul Claudel, and *Nikolas von der Flüe* are to be performed in 1940 in Switzerland. Yet this production of new operas of the more radical type was not the only sign of the interest composers have in the form. A manifesto "Pour un renouveau du Théâtre-Lyrique" was signed by several outstanding French composers: Auric, Delannoy, Honegger, Jaubert, Milhaud, Poulenc, Poland-Manuel and Germaine Tailleferre. In New York city a new American Lyric Theatre was organized for the purpose of performing operas and ballets of American interest. This organization produced with definite success during the month of April two new operas: *The Devil and Daniel Webster* by Douglas Moore to a libretto by Stephen Benet, and *Susanna, Don't You Cry* to a score by Clarence Loomis including music by Stephen Foster. A most interesting opera score was *The Old Lady and the Thief*, written on commission for the National Broadcasting Company by Gian-Carlo Menotti, whose one-act opera, *Amelia Goes to the Ball* was successful in 1938 at the Metropolitan Opera. That there will eventually develop a "radio" opera there can be no doubt, and this new opera by Menotti is a noteworthy attempt in that direction. (See DANCE: Ballet.)

It would be impossible to enumerate important performances by even the greatest symphony orchestras and chamber music groups. Such performances were the first to be revived after the first shock of the crisis. Concerts in Germany tended to be limited, as might be expected, to performance of German classics and to works of young composers who have, as yet, achieved no hearing outside of that country. In England there was considerable activity on the part of the British Broadcasting Company for the performance of new works. A first symphony by Erik Chisholm and a piano concerto by William Busch were performed. *Symphonic Studies* by Alan Ravsthorne and a string quartet by Elizabeth Lutyens were performed at the Contemporary Music Festival at Warsaw. A new violin concerto by William Walton was scheduled to be given its premiere performance by the Cleveland Symphony with Heifetz playing the solo part. In France three new

string quartets were performed by Maurice Jaubert, Henri Tomasi and Olivier Messiaen. A new piano concerto by Jean Francaix was given when Nadia Boulanger conducted the New York Philharmonic-Symphony during her visit to America. Jean Rivière was represented at the Festival of the S.I.M.C. by a *Symphony in D Major* and at the Baden-Baden festival by a string trio. The interest in new Italian music centred largely in the Florentine productions. Among the works performed were G. Francesco Malipiero's *Concerto à Tre*, a violin concerto by Gino Gorini, a pupil of Malipiero, and a cantata by Leone Massino. The first performance of Castelnuovo-Tedesco's second Piano Concerto was given November 2 by the New York Philharmonic-Symphony. Two new symphonies were performed in Helsinki: Uuno Klami's *First Symphony* and Lauri Ikonen's *Second Symphony*. Bela Bartók's *Rhapsody* for clarinet and violin was given a sensational first performance in New York city by the famous Hungarian violinist, Szigeti, and the great exponent of "swing," Benny Goodman. Not to be outdone by the critics who discover infant prodigy virtuosos, two critics sang the praise of two infant prodigy composers, both of America. Lukas Foss, born in Berlin in 1922 and now living in Philadelphia, was praised by Paul Rosenfeld. From Paris came the praise of critics for the compositions of nine-year-old André Mathieu, son of a Montreal musician. (See also MUSIC, POPULAR.) (R. L. Fy.)

Music, Popular. Ironically enough, it was a Polish folk-song, masquerading under the title of "Beer Barrel Polka," that led the American hit parade of 1939. This Shapiro-Bernstein publication sold a total of about 600,000 copies of sheet-music during the year, the first popular song to pass the half-million mark in some time.

Second place was taken by a late arrival, "South of the Border," a reversion to the geographical nostalgias that were once so popular in Tin Pan Alley. In third place was "Deep Purple," whose melancholy strains were evolved from an instrumental piece.

In addition to these three leaders, a dozen hit songs were grouped by *Variety* in the "first fifteen" of popularity as measured by actual sales. These 12 were: "Umbrella Man," "Deep in a Dream," "Penny Serenade," "Little Sir Echo," "Three Little Fishes," "Wishing," "Sunrise Serenade," "Over the Rainbow," "Man with the Mandolin," "Scatterbrain," "Blue Orchids," and "My Prayer." Close to the sacred circle were four more hits, "And the Angels Sing," "Jeepers Creepers," "Stairway to the Stars," and "Rancho Grande."

The year showed a significant continuation of the tendency to make popular songs out of established classics, with frank credit to the source of the melody. Larry Clinton, who had started the cycle with "My Reverie" (after Debussy), again scored heavily when he turned the best theme of Tchaikowsky's *Romeo and Juliet* Fantasie-Overture into "Our Love." André Kostelanetz then capitalized the slow melody from the same composer's fifth symphony as "Moon Love." There was also an echo of Ravel's *Pavane* in "The Lamp is Low," while Raymond Scott made household music out of Mozart's piano sonata in C by simply giving it the title "In an Eighteenth Century Drawing Room."

At the close of 1939 Abe Olman's "Oh, Johnny," dating back to 1917, was riding high once more, proving that a good tune will assert its vitality in the face of the strongest competition. Hawaiian music maintained its vogue, with Ray Kinney and Clara Inter ("Hilo Hattie") as its chief interpreters, and the "swing" treatment of popular melodies showed no signs of weakening, with Glenn Miller's new band added to the established groups under the direction of Benny Goodman, Artie Shaw, Bob Crosby, and other leaders in the improvisational style.

The battle between the American Society of Composers, Authors

and Publishers (ASCAP) and the entertainment interests, particularly radio, was bitterly fought out in the courts, with the creators of America's commercially profitable music winning signal victories in the upholding of the Federal Copyright Law.

One result of this running battle was an increased interest in the work of obscure songwriters and musical amateurs, whose opportunities for performance and publication became greater than ever before. In this development of new talents, the most practical service was given by the New York clearing-house, The Songmart.

Statistics of the music business, however, showed that the traditional methods of publishing and exploiting popular songs were too firmly grounded to be shaken by legal attacks or undermined by novices. The most successful of America's popular songs continue to be produced by a comparatively small group of skilled workmen, to whose efforts the public insists upon giving a just reward. (See also MUSIC.) (S. SP.)

Mussolini, Benito (1883–), Italian statesman and dictator, played a large part in European politics during 1938 and 1939. For his earlier career, see *Encyclopædia Britannica*, vol. 16, pp. 28–31. On Sept. 29, 1938, he formed one of the "Big Four" at Munich which, at 1.30 A.M. on the 30th, reached agreement. His last act of international importance before the close of 1938 was his denunciation, on December 17, of the Franco-Italian agreement of Jan. 1935 regarding Tunisia.

The Italian role in international politics of 1939 began with the two-day visit of Neville Chamberlain to Mussolini in Rome, January 10–12. Nothing developed from this meeting. The rest of the year Il Duce blew hot and cold on the question of peace. On March 26 he suggested that France should begin discussion of the "problems" of Tunisia, Jibuti and the Suez canal, but when Daladier declined, Mussolini did not press his point. On April 7 he ordered the invasion of Albania; on April 20 he accused President Roosevelt of committing "geographical errors" by asking Hitler to refrain from further aggression, but he tempered this speech by calling attention to the Rome fair of 1942 as an indication of Italy's will for peace. On May 14 he delivered a very conciliatory speech at Turin, declaring that "recourse to the sword is not necessary"; and eight days later Italy signed a 10-year treaty of military alliance with Germany. At the approach of war Mussolini redoubled his efforts for peace and as late as September 2 he tried to call a five-power conference. When the war did break out he declared in an official communiqué that Italy would "take no initiative whatever." This alternate sword-rattling and peace-courting revived the old charges of opportunism directed at Mussolini, but in some quarters he was publicly thanked for his peaceful endeavours, notably by Chamberlain in the House of Commons on September 1. (See also ITALY.)

Mustard Gas: see CHEMICAL WARFARE.

Mustard Seed: see SPICES.

Naismith, James (1861–1939), U.S. physical director and inventor of the game of basketball. He was born at Almonte, Ont., Canada, November 6 and received his education at McGill university, Presbyterian college at Montreal, and the Y.M.C.A. college at Springfield, Mass. It was at the latter institution, where he was physical director after his graduation, that he originated and introduced basketball in 1891. The game was originally called Naismith ball and was played with two peach baskets and a soccer ball. Naismith was later director of physical education at the Y.M.C.A. college in Denver (1895–1898) and at the University of Kansas (1898–1937). He died November 28 at Lawrence, Kan.

Narcotics: see DRUGS AND DRUG TRAFFIC.

Natal: see SOUTH AFRICA, THE UNION OF.

National Academy of Sciences. The National Academy of Sciences was incorporated by Act of Congress in 1863 for the purpose of investigating, examining, experimenting and reporting upon any subject of science or art whenever called upon by any department of the United States Government. Membership is by election, in recognition of outstanding achievements in scientific research, and is limited to 350 active members and 50 foreign associates. Members must be citizens of the United States.

At the annual meeting held in Washington, D.C., April 24–26, 1939, 15 new members were elected, as follows: Gregory Breit, Detlev Wulf Bronk, William Bosworth Castle, Frederick Gardner Cottrell, Frederick Parker Gay, Albert Baird Hastings, Vladimir Nikolaevich Ipatieff, Merkel Henry Jacobs, Zay Jeffries, Donald Forsha Jones, George Bogdan Kistiakowsky, Warren Judson Mead, Oscar Riddle, Adolph Hans Schultz, Philip Edward Smith. Three additional foreign associates were elected: Sir Joseph Barcroft, of Cambridge, England; Sir William Bragg, of London; and F. A. Vening Meinesz, of Utrecht, The Netherlands.

Four gold medals were presented at the dinner on April 25, 1939: The Agassiz Medal for Oceanography, to Harald Ulrik Sverdrup, of the Scripps Institution of Oceanography, of the University of California, for his personal oceanographic explorations in Arctic regions and his numerous contributions to physical oceanography and the interrelations between the sea and the atmosphere; the Daniel Giraud Elliot Medal for 1933 and an accompanying honorarium of \$200 to Richard Swann Lull, of the Peabody Museum of Natural History, Yale university, in recognition of his work entitled: "A Revision of the Ceratopsia or Horned Dinosaurs"; the Daniel Giraud Elliot Medal for 1934 and an accompanying honorarium of \$200 to Theophilus Shickel Painter, of the University of Texas, in recognition of his work on the chromosomes of the salivary glands in *Drosophila* in relation to the problems of mutation and genetics, published in *Genetics* and in the *Journal of Heredity* in 1934; and the John J. Carty Medal and an accompanying honorarium of \$3,000 to Sir William Bragg, of the Royal Institution, London, England, in recognition of his fundamental work in X-ray crystal analysis. Sir William Bragg had come to the United States primarily for the purpose of delivering the Pilgrim Trust Lecture before the Academy. The Pilgrim Trust Lecture-ship was established in 1937, to continue for six years under a plan of operation adopted by the Royal Society of London and the National Academy of Sciences, supported through the generosity of the Pilgrim Trust which was set up in Great Britain by Edward S. Harkness, an American. Under this plan, in alternate years the Royal Society of London will invite a distinguished American scientist to lecture before the Society, and in the intervening years the National Academy of Sciences will invite a distinguished British scientist to lecture before the Academy. The first Pilgrim Trust Lecture was given in London on Dec. 8, 1938, by Dr. Irving Langmuir of the Research Laboratory of the General Electric Company. The subject of Sir William Bragg's lecture before the Academy on April 24, 1939, was "History in the Archives of The Royal Society." The autumn meeting was held at Brown university, Providence, Rhode Island, October 23–25, 1939. The Academy publishes an annual report, biographical memoirs of deceased members, scientific memoirs, and monthly *Proceedings*.

The officers of the Academy are: Frank B. Jewett, president; Arthur L. Day, vice president; L. J. Henderson, foreign secretary; F. E. Wright, home secretary; Arthur Keith, treasurer; Paul Brockett, executive secretary. The Academy building is at 2101 Constitution avenue, Washington, D.C.

(P. S. B.)

National Catholic Rural Life Conference: see CATHOLIC RURAL LIFE CONFERENCE, NATIONAL.

National Catholic Welfare Conference: see CATHOLIC WELFARE CONFERENCE, NATIONAL.

National Conservation Bureau: see TRAFFIC ACCIDENTS.

National Debts. Although public debt figures would appear to be precise and meaningful measures comparable from one country to another, there are many limiting factors in such comparisons. Figures are generally available for only national debt, whereas the relative importance of the independent obligations of lesser political units no doubt varies considerably among different countries. In the United States the debt of States, cities, counties, and other minor civil divisions was approximately \$20,000,000,000 in 1939, about half as large as the Federal public debt. The figures as presented herein are confined to national debt because of the limited source material on the debt of local agencies for nearly all countries. Although the figures given in the accompanying table are taken from the same source and have been reduced in so far as possible to a common definition, the official reports on which they are based are not equally reliable, there being a tendency in some countries toward concealment in order to indicate understatements of the debt total. Because of limited comparability of data taken from primary sources, the League of Nations' *Statistical Yearbook* was used and the latest figures from this source are for some date in 1938.

The data are available in original form only in the local currency of each country and, therefore, must be converted into a common unit of measurement. This conversion into dollars has been made through the use of exchange rates prevailing as of the date for which the debt figures are given. Exchange rates are not satisfactory in many instances because of the artificial controls and barriers imposed on foreign exchange in different countries. For instance, the debt of France as measured in dollars has dropped sharply since 1936 because of the decline in the dollar exchange rates of the franc. Even when the conversion into a single monetary unit can be achieved satisfactorily, the matter of population is a factor and the figures must be converted to a per capita basis. Beyond these adjustments there are many other elements which should be considered, such as the value of Government property, the scope of Government functions, the national income, the interest and service costs of the debt, and costs of living. For most of these factors there is little information available.

By far the largest aggregate national debts are owed by Great Britain and the United States, the former being slightly under \$39,000,000,000, and the latter slightly over \$41,000,000,000. These totals are several times as large as the debts of France, Germany, or Italy. When the figures are converted to a per capita basis, the national debt of Great Britain is substantially more than double that of any other country except Australia and New Zealand whose per capita debts are not far below the Great Britain figure. The averages of \$819 per person in Great Britain, \$727 in Australia, and \$724 in New Zealand compare with \$316 in the United States, \$315 in Canada, and \$277 in France. Other countries whose per capita national debts exceed \$200 include the Netherlands, Belgium, and Italy. The latest figure available for Italy is for 1935. No doubt the expanded military program of Italy and its conquest of Ethiopia have greatly enlarged the Italian national debt in recent years.

Comparisons between the national debt and the national income is difficult because the figures are not always available for the same years, and the income figures are even less dependable than are the debt figures. However, some generalizations can be made. It appears that for Great Britain and Australia the national debt

is from one-and-one-half to two times as large as the national income, and in Italy the national debt is more than twice the national income. Also, in France, Belgium, and Greece the national debt exceeds the national income.

In all other countries the national income is larger than the national debt, the ratios of debt to income varying from about three-fourths in Canada, Japan, Spain, the Netherlands, and the United States to less than one-half in Argentina, Denmark, Finland, Germany, Hungary, and Sweden.

The national debt of the United States has only been of substantial size since the World War. Throughout the early part of the 19th century the gross debt never exceeded \$100,000,000. It rose to \$2,678,000,000, or a per capita total of \$77 in 1865, as a result of the Civil War. Thereafter the debt tended downward through the balance of the century and varied only slightly in the early part of the 20th century. In 1916 the United States public debt was \$1,225,000,000 or \$11.96 per person. By 1919 the World War brought about an increase in the national debt to \$25,482,000,000 or \$240 per person. Throughout the '20s there was a decrease, the low point being recorded in 1930 when the obligations of the United States totalled \$16,185,000,000. Deficits in every year since 1930 have brought the level above \$40,000,000,000 at the close of 1939.

Somewhat similar to the trend in the United States, the national debt of Great Britain was much smaller prior to the World War than subsequent thereto. Throughout the entire last quarter of the 19th century, the total national debt varied from approximately £700,000,000 to £800,000,000. Little variation occurred during the first 15 years of the 20th century, the total tending slightly downward. In 1914 the total debt was £651,000,000; by 1920 this had risen to £7,829,000,000. This increase was somewhat larger than the rise in national debt in the United States

National Debt of Various Countries

Country	Date of Latest Comparable Debt Figures	Total Debt in Local Currency (000,000)	Dollar Exchange	Total Debt in Dollars (000,000)	Population at Nearest Comparable Date (000)	Per Capita Debt in Dollars
Africa						
Egypt . . .	4/30/37	97.0 pounds	504.07	488.9	15,904	31
Union of South Africa . . .	3/31/39	280.4 pounds	463.74	1,300.3	9,889	131
America, North						
Canada . . .	3/31/38	3,540.2 dollars	99.716	3,530.1	11,200	315
Mexico . . .	12/31/36	1,326.3 pesos	27.750	368.0	19,320	19
United States	6/30/39	41,131.5 dollars	100.000	41,131.5	130,215	316
America, South						
Argentina . . .	12/31/37	4,032.7 pesos	33.312	1,343.4	12,762	105
Brazil . . .	12/31/37	16,571.2 milreis	5.4492	983	43,247	21
Chile . . .	12/31/38	3,804.3 pesos	5.1758	196.9	4,635	42
Colombia . . .	12/31/38	206.6 pesos	5.001	117.8	8,725	14
Peru . . .	6/30/38	747.6 soles	23.32	174.3	7,100	25
Asia						
India . . .	3/31/39	12,055.6 rupees	35.057	4,226.3	362,000	12
Japan . . .	3/31/38	13,270.1 yen	28.864	3,830.3	71,500	54
Europe						
Belgium . . .	12/31/37	55,762.0 francs	3.3948	1,893.0	8,361	226
Bulgaria . . .	12/31/38	21,778.9 leva	1.2326	268.4	6,371	42
Czechoslovakia . . .	12/31/37	46,005.3 koruny	3.5130	1,616.2	15,270	106
Denmark . . .	3/31/38	1,255.1 kroner	22.251	270.3	3,764	74
Finland . . .	12/31/37	4,302.0 markkas	2.2068	94.9	3,630	26
France . . .	8/31/39	445,541.0 francs	2.6137	11,645.1	41,680	277
Germany . . .	12/31/38	27,241.3 reichmarks	40.080	10,918.3	75,100	145
Greece . . .	3/31/37	49,679.8 drachmas	.8951	444.7	7,013	63
Hungary . . .	6/30/38	1,597.7 pengos	19.759	315.7	9,035	35
Italy . . .	9/30/35	108,636.6 lire	8.1400	8,844.0	42,919	206
Netherlands	12/31/37	4,066.4 guilders	55.602	2,261.0	8,640	262
Norway . . .	6/30/38	1,495.5 kroner	24.011	372.5	2,921	128
Poland . . .	9/30/38	4,073.2 zlotys	8.815	935.7	35,090	27
Portugal . . .	12/31/37	7,229.3 escudos	4.5227	327.0	7,380	44
Rumania . . .	3/31/38	117,874.3 lei	.7337	864.8	19,646	44
Spain . . .	12/31/35	21,779.0 pesetas	13.6704	2,077.3	24,849	120
Sweden . . .	3/31/39	2,606.9 kronor	24.130	629.0	6,310	100
Switzerland	12/31/38	2,753.3 francs	22.612	622.6	4,210	148
Turkey . . .	5/31/38	533.6 pounds	79.701	425.3	18,800	25
Unit. Kingdom	3/31/39	8,301.0 pounds	468.54	38,893.5	47,485	819
Yugoslavia . . .	3/31/39	24,620.0 dinars	2.2781	506.9	15,630	36
Oceania						
Australia . . .	6/30/38	1,275.0 pounds	395.02	5,036.5	6,930	727
New Zealand	3/31/38	290.2 pounds	400.28	1,161.6	1,604	724

Sources: *Statistical Year-Book of the League of Nations*, 1938-39, Geneva, 1939
Federal Reserve Bulletin; Official Government Reports.

as a result of the World War. Throughout the '20s there was no decline in the British national debt, whereas the total in the United States fell off substantially. However, in recent years the national debt of Great Britain has shown little change whereas the United States debt has more than doubled since 1930.

With the outbreak of the war in Europe in Sept. 1939 there appeared immediate evidence of further mounting of national debt in the United Kingdom and elsewhere on the continent. The large debts of the World War had, in most countries, continued to be unliquidated, except in some instances by default, before preparations for and participations in new wars brought new debts. The conflicts in China, Spain and Ethiopia were costly but appear minor in comparison with the prospective cost and new debts of the war of the major European powers which began in Sept. 1939. (See also GOVERNMENT EXPENDITURES; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.) (R. R. N.)

National Defense Power Committee: see PUBLIC UTILITIES.

National Education Association of the United States, organized in Philadelphia in 1857, "is dedicated to the upbuilding of democratic civilization and supported by the loyal co-operation of the teachers of the United States to advance the interests of the teaching profession, promote the welfare of children, and foster the education of all the people." It has a membership of over 200,000 and is governed by a representative assembly composed of delegates from State, territorial, and local units. Its official organ is *The Journal* of the NEA issued to all members monthly except during June, July and August. Special branches of education are represented by 27 departments such as school administrators, teachers colleges, elementary principals, secondary principals, classroom teachers, adult education, and the like.

The Association's winter convention was held in Cleveland, February 25 to March 2, 1939, around the theme "The Foundations of American Education;" its general convention in San Francisco, July 2-7, 1939, around the theme "The Responsibilities of our Profession." The 1940 conventions are to be at St. Louis in February and Milwaukee in July. Leading activities of the Association during 1939 were the Centennial of Teacher Education; the development of Future Teachers of America; the work of the Educational Policies Commission; and continuing efforts on behalf of teacher welfare and Federal aid for general education. American Education Week, which the Association sponsored in co-operation with other groups November 6-12 around the theme "Education for Tomorrow's America" brought more than 8,000,000 visitors into the schools. Association headquarters are in its own building at 1201 Sixteenth Street Northwest, Washington, D.C.; president for 1939-40, Miss Amy Hinrichs, principal of the Audubon School in New Orleans, La.; executive secretary, Willard E. Givens. (See also ACADEMIC FREEDOM; EDUCATION.) (J. E. Mo.)

National Finance: see BANKING; BUDGET; GOLD RESERVES AND GOLD STANDARD; GOVERNMENT EXPENDITURES; INCOME TAX; NATIONAL DEBTS; NATIONAL INCOME; TAXATION; WEALTH AND INCOME, DISTRIBUTION OF.

National Gallery of Art: see SMITHSONIAN INSTITUTION.

National Geographic Society. Organized in 1888 "for the increase and diffusion of geographic knowledge," and since 1899 directed by Gilbert Grosvenor, the National Geographic Society has completed over a half-century of noteworthy achievement. It had in 1939 a mem-

bership of 1,100,000 in all parts of the world—the largest educational institution of our time. In addition to the editorial and photographic surveys constantly being made, the society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives. Narratives of these expeditions and other explorations, together with photographic surveys, are presented to the society's membership through the pages of the *National Geographic Magazine*. To form a pictorial record of world geography, the society has assembled a gallery of some 300,000 photographs, over 25,000 of which are in natural colour. During 1939 the society in co-operation with the Smithsonian Institution sent an archaeological expedition to Veracruz, Mexico. M. W. Stirling, leader of the party, reported on Jan. 16, 1939, the discovery of the oldest dated work of man yet uncovered in the Americas, a Mayan stele bearing a date equivalent to Nov. 4, 291 B.C. Dr. Stirling's account of the find was published in the August issue of the *National Geographic Magazine*. Another outstanding record of archaeological achievement was published in the May 1939 issue as "Frozen Fragments of American History." This is an account of the National Geographic Society-Smithsonian Institution Expedition to Bering sea which, under the leadership of Henry B. Collins, Jr., found the first traces in Alaska of the old Eskimo "Thule" culture.

The National Geographic Society-Cornell university three-year study of auroras, under Dr. C. W. Gartlein, clocked and measured the aurora borealis on the night of Aug. 11, 1939. Photographs in colour and motion pictures were made of these lights which were the most spectacular seen in the northern United States and Canada in ten years. Charles Bittering, N.A., completed his paintings of solar phenomena for which he made studies during the National Geographic Society-U.S. Navy Solar Eclipse Expedition to Canton island in 1937. These paintings were reproduced in the July 1939 issue of the *National Geographic Magazine* to accompany F. Barrows Colton's review of recent astronomical achievements.

Mr. and Mrs. Wendell Chapman conducted an expedition which photographed in colour big game animals in their native habitats from Arizona to Canada; these pictures were shown in the July 1939 issue of the *National Geographic Magazine*. J. D. Whiting made a survey of the ancient cone dwellings in Cappadocia, Turkey; the first pictures in colour of these early Christian retreats were published in December. Dr. Maynard Owen Williams, W. Robert Moore, and Luis Marden made an eight-months' survey of South America for the society. The hostilities in Europe necessitated the postponement of the year-long expedition during which the society, in co-operation with the University of Virginia and the U.S. Coast Guard, planned to survey an area of 4,500,000 sq.mi. in the Central and South Pacific ocean.

In addition to its magazine the society has published a series of nature books. The most recent is *The Book of Fishes*, edited by Dr. John Oliver La Gorce, the most comprehensive, full-colour presentation yet published of the better known species of North American inland and coastal waters. The two-volume *Book of Birds*, edited by Dr. Gilbert Grosvenor and Dr. Alexander Wetmore, in this series is the first book to be published portraying in full-colour illustrations all the known species of birds on the North American continent, north of Mexico. The scientific monograph entitled "National Geographic Society-U.S. Navy Solar Eclipse Expedition of 1937 to Canton Island" was published in 1939 as one of the society's series of *Contributed Technical Papers*. (G. Gr.)

National Guard. The mobilization plans of the Army of the United States call for the National Guard to take the field at peace strength immediately upon the call or

order of the President. Eighteen infantry divisions are to mobilize at once concurrently with four of the Regular Army. One cavalry division and numerous other non-divisional units are also to mobilize without delay as parts of the Initial Protective Force.

The National Guard is the largest of the three components of the Army with strength of approximately 205,000. During the year, Congress authorized a substantial increase in the air corps units of the Guard. The National Guard appropriation for the year ending June 30, 1939, included \$14,024,472 for modern arms and equipment.

On June 30 there were 14,667 commissioned and warrant officers in the active and 674 in the inactive National Guard. Also, 1,602 enlisted men of the active National Guard held commissions in the National Guard of the United States which they would fill immediately upon mobilization. It is planned to increase this last category to approximately 12,000.

In Aug. 1939, approximately 54,000 officers and enlisted men of the National Guard took the field for extensive manoeuvres in the First Army Area at Plattsburg, N.Y., and Manassas, Va. These manoeuvres brought out the fine state of training and esprit of the National Guard.

During 1939, 421 members of the National Guard graduated from Regular Army schools. There were also 33,524 enrolled in the Army extension courses of these schools. Regular Army instructors on full duty with the National Guard numbered 463. The units of the National Guard are now distributed at some 2,200 home stations throughout the 48 States, the District of Columbia, Puerto Rico and the Territory of Hawaii. The organizations and officers of the active National Guard are listed in the Government publication: *Official National Guard Register*. (See also ARMIES OF THE WORLD.) (A. H. BL.)

National Health Program: see DENTISTRY; SOCIALIZED MEDICINE.

National Income. In 1939 the national income in the United States turned upward again after recording a sharp decline in the previous year. The drop in 1938 had come after five successive annual gains. Thus, the national income increased in six of the seven years from 1933 to 1939, inclusive, with the 1939 total of \$68,500,000,000 representing a 70% increase over the \$40,100,000,000 level of 1932. The \$4,500,000,000 increase over the 1938 total of \$64,000,000,000 represents a considerable advance but the dollar national income in 1939 was still more than \$3,000,000,000 below the recovery peak of 1937 and some \$14,000,000,000 under the 1929 record total.

Within the year 1939, economic activity drifted moderately downward during the early months of the year and then turned upward early in the summer. The rise exhibited added vigour early in September after the initiation of hostilities in Europe and the gains were particularly large in the final months of the year. According to the monthly figures on income payments to individuals, as compiled by the United States Department of Commerce, the gain in the final quarter of 1939 over the comparable period of 1938 was \$1,250,000,000, whereas the increase in the first three months of 1939 over the same months of the previous year was \$500,000,000.

Income of the United States was higher in each month of 1939 than in the corresponding month of 1938.

In its official reports, the Department of Commerce defines the national income as the net value of all goods and services produced within a given year. It includes not only the value of the production of such physical commodities as food, houses, roads and industrial equipment, but also the value of intangible services such as those created by hotels, laundries, theatres and telephone

companies. It is the most comprehensive measure of economic activity now available. When everyone is employed and productive capacity is being effectively utilized, the national income is high and general prosperity prevails. On the other hand, when the national income falls, there is unemployment, idle plant capacity and depression.

National income is arrived at by adding together the net value of what each industry produces. The contribution of each industry to the national income equals the gross value of its product, less the value of the wear and tear on its plant and equipment and the value of raw materials it consumed during the year. By making deductions for all raw materials used, all duplication is eliminated.

With but few exceptions, present estimates of the national income are confined primarily to the value of those goods and services which are produced for sale in the market. Goods and services produced within the home for domestic consumption are not included. Thus, the value of the housewife's services in the form of cooking, cleaning and caring for the family is not counted. However, when such services are performed by a servant, their value is reflected in the servant's wages, which are included. Also, personal services performed by individuals for themselves such as shaving and washing one's own car are not included. On the other hand, if similar services are performed by the barber shop or the garage, they are incorporated in the figures. There is no doubt that the value of economic activities performed within the home add greatly to the general well-being but there is no basis for satisfactorily evaluating the yield from these efforts.

Price Influence.—When the national income rises and falls, the magnitudes of the changes do not satisfactorily indicate changes in the quantities of goods and services being produced. The national income is measured in terms of dollars and the buying power or the value of the dollar itself changes from time to time. This is clearly illustrated in comparing the national income in 1939 with the total for 1929.

In 1939, the total of \$68,500,000,000 was more than one-sixth below the 1929 national income of \$82,700,000,000. This does not mean that the quantity of goods and services produced in 1939 was one-sixth below 1929, because prices were lower in 1939 than in 1929. In fact, relative to 1929 the national income in 1939 was 83%, the cost of living of urban wage earners was 82%, and the United States Bureau of Labor Statistics wholesale price index was 81%. These figures appear to indicate that "real" income in 1939 was slightly higher than in 1929. The price series quoted are not truly representative of all prices and therefore do not lend themselves to such precise comparisons, but it is obvious that the output of goods and services in 1939 was little different from the record pre-depression levels. It also appears probable that the "real" national income in 1939 was approximately equal to that of 1937.

Average prices for the year 1939 as a whole were slightly under 1938 so that the \$4,500,000,000, or 7%, increase in the national income in 1939 was entirely accounted for by an enlarged production of commodities and services. The rise in real income in 1939 probably was larger than in any other year during the past decade with the exception of 1936. This evidence is substantiated by the rise in nearly all available indexes of physical production.

Industrial Source.—The contribution of each industry to the national income is a valuable measure of its relative importance in the total output of the nation, but is not always related to indispensability of the industry.

Some industries, like mining, contribute only a very small proportion to the national income but are highly essential segments of the economy.

In the accompanying table data are presented showing the net value of product or the contributions of each of the major indus-

tries to the national income in the United States. These data are significant indicators of the industrial character of a nation. For instance, in 1929 the commodity producing industries (agriculture, mining, manufacturing and construction) contributed approximately 40% of the national income. The commodity handling industries, including transportation, trade and the public utilities accounted for about one-fourth of the national income the remaining third having been contributed by the service creating industries such as Government, finance and service proper. Available data over a long period of years indicate a gradual decline in the relative importance of the commodity producing industries and a relative rise in the importance of the service industries in the United States. This is to be expected as an economy becomes more mature.

The substantially greater fluctuations in the commodity industries are revealed by the magnitude of the declines from 1929 to 1932, and again from 1937 to 1938 in these industries as compared with the service industries. The difference is particularly marked in 1938, for in that year the commodity industries which in 1937 contributed about one-third of the national income, accounted for more than three-quarters of the drop from 1937. As would be expected, the recoveries in 1932 and 1937 and again in 1939 were largest in these commodity industries. Construction was an exception with the recovery in this industry after 1932 lagging far behind the improvement in other industries.

National Income, by Industrial Divisions*
(In millions of dollars)

Item	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939†
Total national income	82,601	69,104	54,249	40,089	42,504	50,611	55,794	65,226	71,853	63,993	68,500
Agriculture	7,258	5,622	3,729	2,551	3,419	4,553	5,276	5,970	6,378	5,432	5,660
Mining	1,789	1,237	687	478	534	920	954	1,229	1,428	1,051	1,121
Electric light and power, and manu- factured gas	1,268	1,195	1,139	1,011	941	1,034	1,042	1,116	1,201	1,143	1,215
Manufacturing	20,207	14,983	10,192	6,012	8,164	10,514	12,405	14,937	17,551	12,803	15,400
Contract construction	3,762	2,957	1,844	820	547	813	920	1,634	1,861	1,759	1,891
Transportation	7,095	6,140	4,937	3,623	3,606	3,817	4,136	4,796	5,142	4,409	4,744
Communication	1,045	1,011	908	722	639	676	722	767	816	804	823
Trade	11,289	9,406	7,589	5,380	6,013	7,023	7,578	8,459	9,181	8,761	8,970
Finance	8,845	7,840	6,400	5,141	4,552	4,921	5,330	6,044	6,576	6,116	6,294
Government, including work-relief wages	6,317	6,434	6,452	6,349	6,563	7,626	7,919	9,447	9,133	9,845	10,170
Government, excluding work-relief wages	6,317	6,434	6,452	6,349	5,917	6,196	6,580	7,064	7,394	7,701	8,190
Work-relief wages					646	1,430	1,339	2,383	1,739	2,144	1,980
Service	9,750	8,851	7,447	5,632	5,368	6,223	6,845	7,661	8,588	8,200	8,367
Miscellaneous	3,976	3,428	2,925	2,339	2,157	2,488	2,660	2,868	3,048	2,550	2,632
Social security contributions of em- ployers						3	7	200	950	1,119	1,210

*Source: United States Dept. of Commerce. †Preliminary.

(See also GOVERNMENT EXPENDITURES; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; WEALTH AND INCOME, DISTRIBUTION OF.) (R. R. N.)

National Insurance: see SOCIAL SECURITY.

National Labor Relations Board: see LABOUR UNIONS; LAW (CASE): *Labour*; DEMOCRATIC PARTY; SUPREME COURT OF THE UNITED STATES: *Labour*; UNITED STATES: *The NLRB*.

National Monuments: see NATIONAL PARKS AND MONUMENTS.

National Munitions Control Board: see LEGISLATION, FEDERAL.

National Parks and Monuments. In two-thirds of a century, a system of national parks and monuments undreamed of a century ago in any political economy, has been established and developed in the United States. The Yellowstone, the first national park, was established in March 1872. On Dec. 31, 1939, there were 155 separate areas in the national park and monument system of the United States, with a total area of 20,859,891 acres. Twenty-five of these areas are national parks, areas reserved by the Congress because

of their superlative scenery or some historic or scientific feature of outstanding national interest. Eighty are national monuments, areas established by presidential proclamation under authority of the Congress because of historic, prehistoric, or scientific interest of national calibre.

In addition there are four national historical parks, 11 national military parks, seven battlefield sites, eight national memorials of various types, four national historic sites, one national recreational area, 11 national military cemeteries, three national parkways, and the park system of the national capital, consisting of over 700 separate units in and around Washington, D.C.

Through Congressional action two national parks primarily of historical value were given new status. The Abraham Lincoln National Park, Kentucky, became a national historical park and Fort McHenry National Park, Maryland, a national monument. The Chalmette National monument, Louisiana, became the Chalmette National Historical Park.

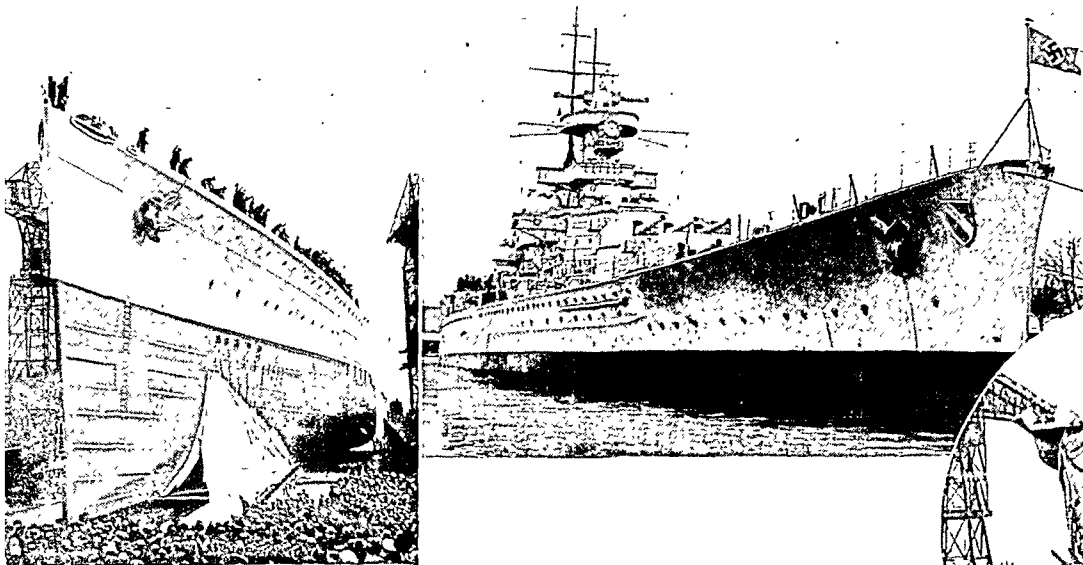
By presidential proclamation the following new national monuments were established: Homestead National Monument of America (Nebraska), including all of the homestead of Daniel Freeman who filed the first claim under the Homestead Law signed by President Lincoln in 1862; Badlands National Monument (South Dakota), containing over 150,000 mi. of the most important "badland" geological features in the world; Santa Rosa Island National Monument (Florida), a long narrow strip of white sand forming a barrier island off the Gulf coast of Florida and illustrating in an outstanding manner natural processes by which much of the shoreline of the continent has been formed; and Tuzigoot National Monument (Arizona), with interesting prehistoric ruins.

Other interesting additions to the Federal park system were Federal Hall Memorial and the Philadelphia Customhouse National Historic Site, established by Secretary of the Interior Harold L. Ickes under authority of the Historic Sites Act.

New York city's old subtreasury building, itself of historic interest, stands on the site of old Federal Hall, where George Washington took the oath of office as President of the United States; where the Declaration of Independence was read to the populace July 18, 1776; where the first 12 amendments to the Constitution (10 of them forming the Bill of Rights) were adopted—among many epoch-making events in American history.

The Philadelphia Customs House, over 100 years old, was built to house the Second Bank of the United States. When the fiscal system of the Federal Government was changed, the bank became the Second Bank of the United States of Pennsylvania and continued in operation until 1841, when it was closed as a result of the panic of 1837. Shortly afterwards it was occupied by the Customs service.

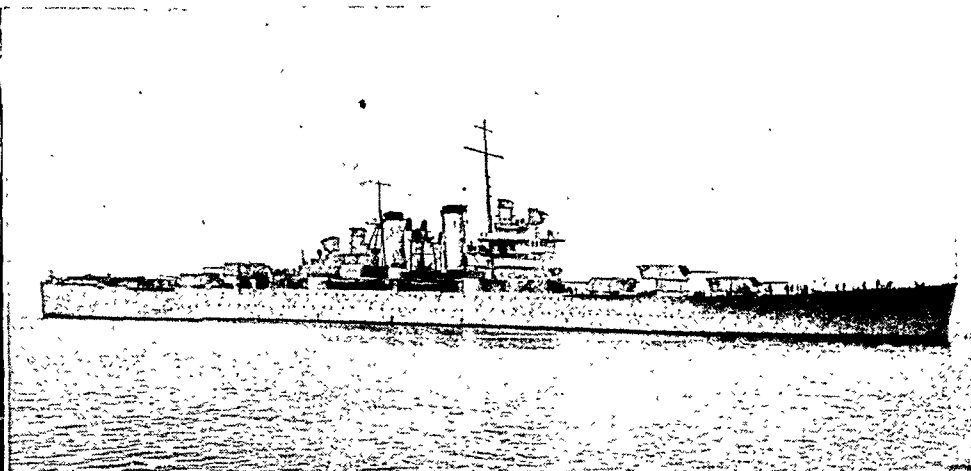
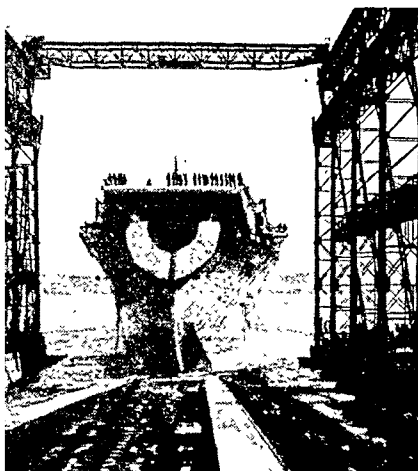
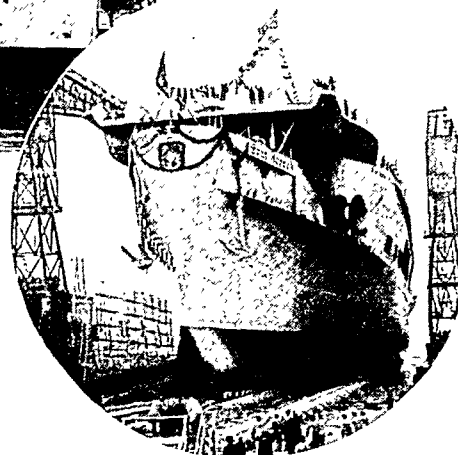
The Skyline drive, throughout the length of the Shenandoah National Park, was completed and opened to travel. Excellent progress also was made on the Blue Ridge parkway, to connect Virginia's Shenandoah Park with the Great Smoky Mountains National Park in North Carolina and Tennessee. One hundred miles of the parkway was opened to travel. Interesting progress was made also on the Natchez Trace, following generally the route of the historic highway between Natchez, Miss. and Nashville, Tenn.



Above, left: THE "PRINCE OF WALES," second British 35,000-ton battleship of the new "King George V" type, was launched May 3, 1939, at Birkenhead

Above, right: FIRST LARGE BATTLESHIP of the German fleet, the 26,000-ton "Scharnhorst," commissioned Jan. 7, 1939, at Wilhelmshaven

Right circle: THE FIRST GERMAN AIRCRAFT CARRIER, "Graf Zeppelin," slid down the ways Dec. 8, 1938



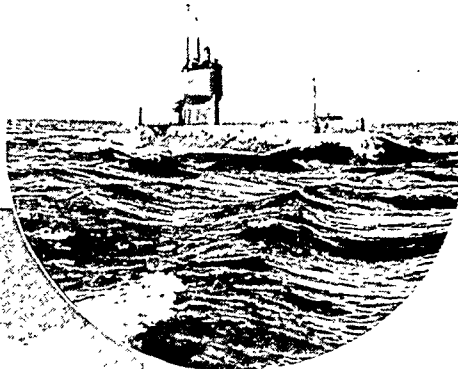
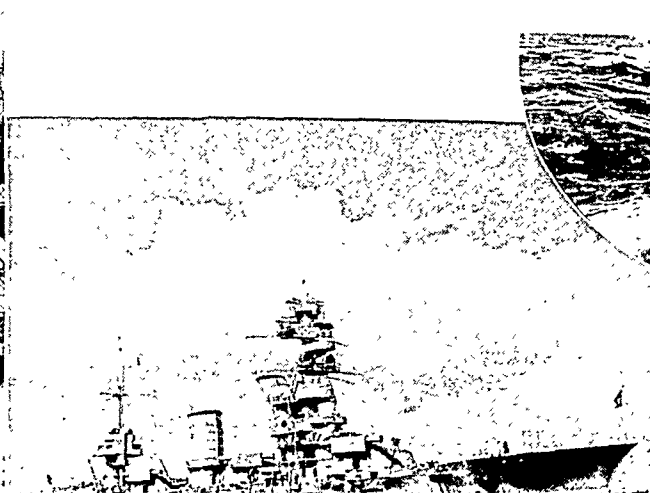
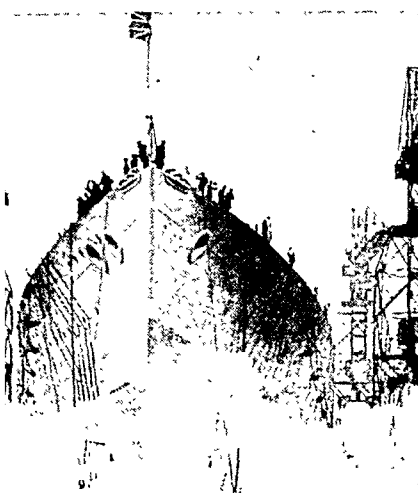
Above, left: AMERICA'S LATEST AIRCRAFT CARRIER, the "Wasp," was launched April 4, 1939

Above, right: U. S. CRUISER "ST. LOUIS," commissioned May 19, 1939

Right circle: RUSSIAN SUBMARINE on manoeuvres in the Baltic

Below, left: THE 35,000-TON "KING GEORGE V," first British battleship built in 14 years, was launched Feb. 21, 1939, at Newcastle

Below, right: THE SOVIET BATTLESHIP "Marat" at anchor near Kronstadt, U. S. S. R.



The Great Smoky Mountains National Park attained full status. International complications have held in abeyance plans for its dedication by the President. The various areas of the Federal park system were visited by 15,454,367 persons during the year 1939.
(A. B. Ca.)

National Power Policy Committee: *see* PUBLIC UTILITIES.

National Socialist Party: *see* FASCISM; GERMANY.

National Wealth: *see* WEALTH AND INCOME, DISTRIBUTION OF.

National Youth Administration: *see* EDUCATION, VOCATIONAL; GOVERNMENT DEPARTMENTS AND BUREAUS.

Natural Gas. Production of natural gas in the United States suffered only a comparatively small reduction during the depression years, dropping from 1,943,000,000,000 cu.ft. in 1930 to 1,556,000,000,000 in 1933, and recovering to approximately the former level in 1935; in 1938 production declined 5% to 2,295,600,000,000 cu.ft., of which 29% was used in the field, 50% for industrial and 21% for domestic and commercial consumption. The largest item of industrial use is the production of carbon black, which took 14% of the total output. Production in Canada increased slightly in 1938, to 32,400,000,000 cu.ft., and preliminary figures indicate a further increase in 1939.
(G. A. Ro.)

Nauru: *see* MANDATES; PACIFIC ISLANDS, MANDATED.

Navicert System: *see* NEUTRALITY.

Navies of the World. One of the results of the war which broke out on Sept. 3, 1939, was to stimulate the construction of new warships, not only in the countries involved, but in others with interests liable to be affected. By the end of the year there were no fewer than 33 battleships building or about to be begun, of which nine were British, eight American, four Japanese, four French, two Italian, four German, and two Russian. In the case of four British, two American, four Japanese and possibly two German, the displacement is between 40,000 and 45,000 tons. The remaining 21 ships are all to be of 35,000 tons, in accordance with the original limitation imposed by the London Naval Treaty of 1936, which was expanded by agreement in 1938 to 45,000 tons.

None of the various designs provides for a speed of less than 28 knots, and in the majority of cases the figure exceeds 30 knots. Other features common to all are absence of torpedo tubes, extensive protection against plunging fire or air bombing, a plentiful anti-aircraft armament, and the inclusion of seaplanes and catapults in the equipment. General similarity is inevitable in ships whose maximum displacement is limited, giving little latitude for innovations if adequate defensive power, protection, speed, and seakeeping qualities are to be ensured. Considerable variation exists as regards the calibre of the main armament. British 35,000 ton battleships are to be armed with ten 14-in. guns, and the 40,000 tonners with 16-inch. American, Japanese and Russian battleships are all built to mount nine 16-in., while the French, Germans and Italians have preferred either eight or nine 15-inch. In range and accuracy there is believed to be little to choose between the three calibres, the main difference being the weight of the gun and its mounting, and of the projectile that it fires. With the exception of Italy, whose naval staff regard such vessels as superfluous in view of the country's geographical position, all these powers are building aircraft carriers, varying in displacement from 10,050 to 23,000 tons. A typical example of these aircraft carriers, which was completed in 1938, is the British "Ark Royal," of 22,000 tons, with a speed of 31 knots. She is armed with 16 dual-purpose guns of 4.5-in. calibre, and can operate 60 aircraft,

though her spacious hangars, arranged on two decks, could undoubtedly accommodate many more than this.

Cruisers have hitherto been limited by treaty to a displacement of 8,000 tons, and a maximum gun calibre of 6.1-in., but this does not apply to Japan, which was not a party to the 1936 London Treaty. There have been rumours that battle cruisers of about 15,000 tons are being built by that country, and one is even reported to have been launched during 1939; but otherwise there is no evidence that 8,000 tons does not mark the limit of Japanese cruiser displacement. Destroyers built in recent years are remarkable for their size, many of those building for the British Fleet being over 1,900 tons displacement. So far the United States has built none beyond 1,850 tons, but Japan's current program includes a dozen of about 2,000 tons. France is building two types, one of about 2,900 tons, the other of under 1,800 tons. Italy has not gone beyond 1,729 tons in destroyers, but has built a dozen cruisers of 3,362 tons, obviously designed to repel destroyer attacks.

Germany's biggest destroyers are of 1,811 tons, but Russia has completed several of about 2,900 tons.

Submarines are being built in very large numbers. In the British and American Navies, under-water craft building or on order at the end of 1939 numbered 14 and 19 respectively. Japan has at least a dozen under construction; France 24; Italy 16; and Germany an uncertain but undoubtedly large number. Russia, which is believed to possess more submarines than any other nation, has published no figures, but 20 is a conservative estimate of the number in hand.

British Naval Strength.—When the war with Germany began, active steps were in progress for the replacement of the high proportion of out-of-date ships which resulted from the restrictions imposed by the Naval Treaties of 1922 and 1930. Of the new battleships under construction, four were understood to have been launched by the end of 1939, and it was hoped to complete one, if not two, by the end of 1940. Good progress had also been made with other categories of new warships.

At the end of 1939 the British Navy comprised the following warships: 11 battleships; 3 battle cruisers; 15 heavy cruisers mounting 8-in. guns; 43 cruisers with 6-in. guns; 6 anti-aircraft ships (ex-cruisers); 1 minelayer; 5 first line aircraft carriers; 181 destroyers; 58 submarines; 51 escort vessels; 44 minesweepers; 8 patrol vessels; 3 aircraft tenders; 2 netlayers; 20 river gunboats; 6 coastal minelayers; over 25 motor torpedo boats; and 3 monitors. At the outbreak of war there were under construction or authorized (in many instances as replacements): 9 battleships; 23 cruisers; 4 minelayers; 6 aircraft carriers; 18 destroyers; 14 submarines; 26 escort vessels; 20 minesweepers; 3 patrol vessels; 2 river gunboats; and 22 motor torpedo boats. A supplementary program, passed shortly before war began, authorized the construction or purchase of a large number of small craft, mainly trawlers and patrol vessels of the whale-catcher type. Undoubtedly many more new ships have been begun since the outbreak of war, but particulars of these have not been published.

One of the first steps taken by the British Government on the outbreak of war was to give notice of suspension of all its obligations under the London Naval Treaty of 1936, and under the Naval Agreements with Russia and Poland, thus giving all the parties to these Treaties freedom from the restrictions as to displacement and gun calibre placed on the various categories of warships by the Conventions in question.

The total personnel provided for in the 1939 Navy Estimates was 133,000, just 20,000 less than at the outbreak of the World War in 1914.

Naval forces of the Dominions, including Royal Indian, Royal Australian, and Royal Canadian Navies and the New Zealand

Division, are included in the above figures, so far as material is concerned, but not their personnel, which amounts to over 10,000 reserves. There are also reserves of personnel in other British overseas territories, such as Newfoundland, Kenya, South Africa, Hongkong, and the Straits Settlements.

United States Naval Strength.—Large increases in the numbers of all classes of warships had been approved up to 1939, when proposals for additional construction were being brought forward. The total strength at the end of that year included 15 battleships; 18 heavy cruisers with 8-in. guns; 19 light cruisers with 6-in. guns; 5 aircraft carriers; 221 destroyers; 94 submarines; 10 escort vessels and gunboats; 23 patrol vessels; 5 aircraft tenders; 8 light minelayers; and 41 minesweepers. Under construction or about to be ordered were 8 battleships; 6 cruisers; 2 aircraft carriers; 29 destroyers; 19 submarines; 6 aircraft tenders; 1 minelayer; 2 minesweepers; 3 motor patrol vessels; and 6 motor torpedo boats. The total personnel amounts to 138,903, exclusive of reservists.

Japan.—Though official information concerning the Imperial Japanese Navy is nearly non-existent, it is known that at the end of 1939 the total strength was: 9 battleships, which may have been increased to 10 (if one which was to have been demilitarized has been re-armed as proposed); 6 aircraft carriers; 12 cruisers with 8-in. guns; 27 cruisers with 6-in. or 5.5-in. guns; 5 old cruisers rated as coast defence ships; 122 destroyers; 12 torpedo boats; 63 submarines; 15 submarine chasers; 5 aircraft tenders; 14 minelayers; 18 minesweepers and 11 gunboats. So far as unofficial reports are to be relied upon, the following ships are believed to be building: 4 battleships and possibly two battle cruisers; 6 cruisers; 1 or 2 aircraft carriers; at least 4 destroyers; 12 submarines; and numerous smaller craft. The total personnel when last reported was 107,000, but this may have been increased.

France.—The French Navy possesses (Jan. 1, 1940) 7 battleships; 7 cruisers with 8-in. guns; 11 cruisers with 6-in. or 6.1-in. guns; 1 aircraft carrier; 58 destroyers, of which 32 are of between 2,126 and 2,884 tons displacement; 13 torpedo boats, one of these being of the motor type; 77 submarines; 2 minelayers; 1 netlayer; 1 aircraft tender; 8 escort vessels; 27 patrol vessels; 13 minesweepers; 17 submarine chasers; and 9 river gunboats. There are also two old battleships which have been relegated to training duties. Under construction or about to be laid down are: 4 battleships; 2 aircraft carriers; 3 cruisers; 30 destroyers; 30 motor torpedo boats; 25 submarines; 4 aircraft tenders; 2 escort vessels; 15 minesweepers; and 14 submarine chasers. The total personnel is about 85,000.

Italy.—Italy is the first power to complete any 35,000-ton battleships of modern design. Her strength at the end of 1939 comprised 6 battleships, of which 2 were under reconstruction; 7 cruisers mounting 8-in. guns; 14 cruisers with 5.9-in. or 6-in. guns; 1 obsolete cruiser, of value only for coast defence; 61 destroyers; 73 torpedo boats; 72 motor torpedo boats; 105 submarines; 1 escort vessel; 1 aircraft tender; 13 minelayers; 42 minesweepers; and 13 gunboats. There were under construction: 2 battleships; 14 cruisers; 14 or more submarines; and an uncertain number of motor torpedo boats. The personnel numbers about 75,000.

Germany.—German naval strength when the war began included 2 battleships; 3 armoured ships of 10,000 tons, popularly known as "pocket battleships"; 2 cruisers with 8-in. guns; 6 cruisers with 6-in. guns; 22 destroyers; 12 torpedo boats; 20 motor torpedo boats; 71 submarines; 10 patrol vessels; and 37 minesweepers. Under construction at the same date were four battleships; 2 aircraft carriers; 3 cruisers armed with 8-in. guns; 4 cruisers armed with 6-in. guns; 8 destroyers; 30 torpedo boats; 12 motor torpedo boats; 28 submarines; and 18 minesweepers. Two obsolete battleships, officially rated as training ships, were employed in the attack on Poland. A great many more submarines are believed to have been begun since. The total personnel is uncertain, but unquestionably exceeds 50,000.

U.S.S.R.—Official information concerning the Soviet Fleet is as scarce as in the case of the Imperial Japanese Navy, but the following particulars are believed to be reliable. Completed ships include 3 old battleships; 5 cruisers (excluding obsolete vessels used for training); 33 destroyers; 21 torpedo boats; 130 motor torpedo boats; 150 submarines; and a large number of minelayers and minesweepers. Under construction or about to be begun are: 2 battleships; 2 cruisers; 3 aircraft carriers; 6 destroyers; and about 20 submarines. There are no recent statistics of personnel, but the total is probably between 30,000 and 40,000.

Other European Countries.—Of the smaller naval powers, the one that has taken the most active steps to increase its naval strength is the Netherlands, which has in hand the biggest program of construction in Dutch history. The existing fleet includes 4 cruisers; 8 destroyers; 10 torpedo boats, of which 2 are of the motor type; 23 submarines; 1 gunnery training ship; 3 escort vessels; and 1 old coast defence ship; 11 minelayers; and 15 minesweepers. It is proposed to build 3 battle cruisers; which will be by far the biggest warships ever designed for the Royal Netherlands Navy. There are building or on order 3 cruisers; 4 destroyers; 30 motor torpedo boats; 7 submarines; and 7 escort vessels. Particular concern is felt in the Netherlands for the safety of the vast Dutch possessions in the East Indies, for the protection of which the existing fleet is thought to be insufficient.

In the Scandinavian countries there is great uneasiness in regard to the international situation. It is plain that the tendency of Germany and Russia to expand at the expense of their immediate neighbours is causing concern to those on the opposite side of the Baltic. Sweden (Jan. 1, 1940) possesses 2 cruisers; 8 coast defence ships; 8 destroyers; 15 torpedo boats, 2 of which are of the motor type; 16 submarines; and 6 minesweepers. There are under construction or to be laid down shortly: 2 coast defence ships; 2 destroyers; 4 motor torpedo boats; 5 submarines; and 10 minesweepers.

The Royal Norwegian Navy comprises 4 coast defence ships; 20 torpedo boats; 9 submarines; 4 minelayers; and 11 minesweepers. Under construction are 2 destroyers; 3 torpedo boats; 8 motor torpedo boats; and 2 submarines.

Denmark, whose fleet (Jan. 1, 1940) comprises 2 coast defence ships; 17

torpedo boats; 10 submarines; and 3 minesweepers, is building 2 torpedo boats; 2 submarines and a minelayer, part of the most extensive program that has been put in hand for a long time past.

The Finnish Navy, at the time of the Russian invasion, included 2 coast defence ships; 5 submarines; 7 motor torpedo boats; 4 gunboats and a number of small minelayers and minesweepers.

Poland, although her navy sustained severe losses when attacked by Germany, still possesses 3 destroyers, which are now serving with the British Fleet, and 5 submarines. Two more submarines were ordered in France some months ago.

Estonia proposes to build a number of motor torpedo boats, one of which was ordered in England early in 1939. Otherwise her Navy consists of 2 submarines; 1 torpedo boat; 4 minelayers and a number of smaller craft.

Latvia possesses two submarines, 2 minesweepers and 1 gunboat; and Lithuania has a single patrol vessel, which since the German occupation of Memel has had to seek refuge in a Latvian port.

Spain is still engaged in reorganizing her naval forces after the Civil War. There are in service (Jan. 1, 1940) 6 cruisers; 19 destroyers; about 25 torpedo boats; 13 submarines; 4 minelayers; 6 escort vessels; and many smaller craft. The old battleship "Jaime Primo" is still in existence, but is of little fighting value except for coast defence purposes. New ships ordered before the Civil War include two destroyers, 3 submarines and 2 minelayers. Construction of these has doubtless been resumed.

The Portuguese Fleet, as modernized under the present regime, comprises 6 destroyers; 8 escort vessels; 1 torpedo boat; 3 submarines; and 4 gunboats. It had been proposed to order 3 destroyers; 3 submarines; and 6 motor torpedo boats during 1939, but the outbreak of war between the Allies and Germany has held up this program.

Greece possesses 1 old cruiser; 10 destroyers; 13 torpedo boats; 6 submarines; 1 large and 8 small minelayers; and 2 motor torpedo boats. Two destroyers and two motor torpedo boats are under construction, and two submarines are projected.

The Turkish Fleet comprises one old battleship; 4 destroyers; 9 submarines; 2 old cruisers used for training; 3 motor torpedo boats; 3 minelayers; and various smaller craft. Four destroyers; 4 submarines; and 2 minelayers are under construction in British shipyards.

Rumania has 4 destroyers; 1 submarine; 3 old torpedo boats and some minor war vessels. Two submarines and 2 minelayers are building in Rumania, and it is proposed to acquire 3 motor torpedo boats.

The Yugoslav Navy possesses 4 destroyers; 4 submarines; 8 torpedo boats; 10 motor torpedo boats; 1 aircraft tender; 6 minelayers; and an obsolete cruiser, used for training. A destroyer, a patrol vessel and 2 submarines are under construction, but as the last mentioned are building in Germany it is probable that they will be appropriated by that country.

Hungary has 4 armed patrol vessels on the Danube, but, following the annexation of Austria and Czechoslovakia, the river flotillas of these countries have been absorbed into the German Navy.

South America.—Recently several South American states have taken steps to renovate their naval forces.

The Argentine Navy includes 2 old battleships; 3 cruisers; 4 coast defence ships; 16 destroyers; 3 submarines; and 15 patrol vessels. To these will need to be added 2 escort vessels under construction in an Argentine dockyard.

Brazil possesses (Jan. 1, 1940) 2 battleships; 2 cruisers; 1 destroyer; 6 torpedo boats; 4 submarines; and 4 minelayers. Three destroyers and 2 minelayers are to be built in Brazilian yards.

Chile, which in naval efficiency is second to no other country in South America, has been restrained by financial considerations from increasing her fleet, which at present comprises 1 battleship; 3 cruisers; 8 destroyers; and 9 submarines. A program of new construction to include 2 cruisers, 2 submarines and an escort vessel has not yet materialized, with the exception of the last ship, which is being built in Chile.

Peru has undoubtedly been hindered by the instability of her recent Governments from making much progress in the modernization of her Navy. It includes 2 cruisers; 2 destroyers; 4 submarines; and 1 torpedo boat. Similar considerations apply to Ecuador, whose sea force (Jan. 1, 1940) is restricted to a single gunboat.

Colombia has in service 2 destroyers; 2 minesweepers; and some vessels of less importance. Venezuela can muster 5 gunboats, while Uruguay has 3 modern patrol vessels and 2 old gunboats used for training. Paraguay's force comprises 3 river gunboats.

Mexico has 4 modern escort vessels; 2 older vessels of a similar category; 10 small gunboats; and 3 patrol vessels. Cuba has 2 escort vessels, recently reconstructed; 5 gunboats; and 7 patrol vessels. Haiti has 2 small patrol vessels of no fighting value. The Dominican Republic, in addition to an armed transport, has 3 patrol vessels, purchased from the United States Coast Guard. Nicaragua has a patrol vessel acquired from the same source. None of the other Central American republics appears to possess any vessels of importance.

Asia.—In the Far East, the Chinese Navy, for practical purposes, has ceased to exist, though it is possible that a few small craft survive in the upper reaches of the Yangtze. Three or four of the larger vessels of the Chinese Fleet have been repaired and added to the Japanese Navy.

On the other hand the Navy of Thailand, to give Siam its new name, has been completely reorganized as regards its materials and personnel. Most of its new ships have been built in Japan or Italy. There are in service 4 coast defence ships; 1 destroyer; 21 torpedo boats, 9 of which are of the motor type; 4 submarines; 2 escort vessels; 2 minelayers; and sundry smaller craft. Two cruisers are under construction in Italy.

Iran has also developed a small Navy under Italian tutelage. This includes 7 gunboats; 3 motor patrol boats; and 1 or 2 smaller vessels.

Manchoukuo, as a satellite of Japan, has acquired 1 destroyer; 15 gunboats; and 16 patrol vessels. Many of these are understood to be river craft. Iraq has 4 patrol vessels, a yacht and a tug.

With a first class war in progress at sea, developments in naval affairs are likely to be rapid. Those countries with extensive programs of new construction in hand will naturally do their utmost to accelerate them, though difficulty in obtaining materials may cause delay in some cases.

Navies of the World

Country	Battle-ships & Battle Cruisers	Coast Defence Ships	Cruisers	Aircraft Carriers	Destroyers	Torpedo Boats	Submarines	Escort Vessels
British Empire	14	3	58	5	181	25	58	51
U. S. A.	15	..	37	5	221	..	94	5
Japan	9 or 10	5	39	6	122	12	63	..
France	7	2	18	1	58	13	77	8
Italy	6	1	21	..	61	145	105	1
Germany*	5	2	8	..	22	12	71	..
Russia	3	..	5	..	33	151	150	..
Turkey	1	..	2	..	4	3	9	..
Greece	..	..	1	..	10	13	6	..
Spain	..	1	6	..	19	25	13	6
Sweden	..	8	2	..	8	15	16	..
Neth'lnds	..	1	4	..	8	10	23	3
Norway	..	4	..	..	..	20	9	..
Denmark	..	2	..	..	..	17	10	..
Finland	..	2	..	..	..	..	5	..
Poland	..	..	..	..	3	..	2	..
Estonia	..	..	..	..	..	1	2	..
Latvia	..	..	..	..	..	..	2	..
Portugal	..	..	..	..	6	1	3	8
Rumania	..	..	..	..	4	3	1	..
Yugoslavia	..	..	..	..	4	18	4	..
Argentina	2	4	3	..	10	..	3	..
Brazil	2	..	2	..	1	6	4	..
Chile	1	..	3	..	8	..	9	..
Peru	..	..	2	..	2	1	4	..
Colombia	..	..	..	..	2	..	..	6
Mexico	..	..	..	..	..	..	..	..
Thailand	..	..	..	..	..	..	..	..
(Siam)	..	4	..	..	1	21	4	2
Manchoukuo	..	..	..	..	1	..	..	..

*The German figures are as of Sept. 3, 1939.

For convenience of reference, the table above shows the strength in the principal categories of warships of the navies of the world at the end of 1939. (See also AIR FORCES; ARMIES OF THE WORLD; BLOCKADE; EUROPEAN WAR; MUNITIONS OF WAR; STRATEGIC MINERAL SUPPLIES; SUBMARINE WARFARE; TACTICS IN THE EUROPEAN WAR; UNITED STATES: *History*.) (F. E. McM.)

Nazis: see ANTI-SEMITISM; ARGENTINA; BOHEMIA AND MORAVIA; BRITISH EAST AFRICA; EDUCATION; FASCISM; GERMANY; MINORITIES.

Nebraska, one of the States formed from the Louisiana Purchase; area, 76,808sq.mi.; population, 1930, 1,377,963, estimated July 1, 1937, 1,364,000; capital, Lincoln, 75,933. The largest city is Omaha, 214,006. In 1930, 54.9% of the population was urban; 1,355,702 were white, 13,752 coloured, 1,262,617 native-born and 115,346 foreign-born.

History and Government.—The executive power is vested in the governor and eight other administrative officers. The governor prepares the biennial budget, has a considerable appointing power, and a veto power which extends to items in appropriation bills. The principal State officers for 1939-41 were governor, R. L. Cochran; lieutenant-governor, W. E. Johnson; auditor, Ray Johnson; secretary of State, Harry R. Swanson; treasurer, John Havekost; attorney-general, Walter R. Johnson; superintendent of public instruction, Charles W. Taylor.

The legislative power is vested in a single chamber of 43 members, known as the Senate. Senators are elected for single-member districts on a non-partisan ballot for a term of two years. The lieutenant-governor is the presiding officer, though a speaker acts in his absence. Regular sessions are biennial in the odd-numbered years, though special sessions may be called either by the governor or by two-thirds of the membership.

Education.—Higher education is supported by the State at the University of Nebraska and in four teachers' colleges. The State university consists of ten colleges and three schools of collegiate grade. The total enrolment for 1938-39 exceeded 12,000, of whom more than 9,000 were resident students of collegiate rank. Property and equipment are valued at \$11,700,000 and the biennial appropriation for 1939-41 was \$7,530,270 (including Federal grants). The management of the university is vested in an elec-

tive board of regents. The four teachers' colleges offer collegiate training for four years leading to a bachelor's degree. The total enrolment in 1939 was 4,877 and the faculties numbered 186. Control is vested in a board of seven members. Elementary and secondary education is in the hands of local school districts of which there are now more than 7,000 in the State. Financial support is derived almost wholly from the local tax on property. The total enrolment in 1937 was 300,041 and the number of teachers employed was 17,440. School property was valued at \$84,424,329, school expenditures were \$20,525,000 and school indebtedness amounted to \$30,220,830.

Charities and Corrections.—The dependent, delinquent and defective classes are cared for in 17 institutions under the supervision of the State Board of Control. In addition to the penitentiary and reformatories for men and women, there are industrial schools for boys and girls, hospitals for the blind, the deaf and the feeble-minded, three hospitals for the insane, one home for soldiers and sailors, an orthopaedic hospital and a home for dependent children. The total institutional population in 1939 was 9,103 and the legislative appropriation, \$5,574,989. In addition there is an appropriation to the State assistance fund for the biennium 1939-41 of more than \$14,900,000. This fund is administered by a State assistance director in co-operation with the county boards.

Banking and Finance.—State banks under the supervision of the State banking department numbered 290 on June 30, 1939—a decrease from 415 in 1933. These banks have resources of \$78,555,507. There were also 54 building and loan associations with resources of \$58,946,419 and 161 co-operative credit associations with assets of \$2,452,498. National banks at the same date numbered 136 with resources of \$213,411,000.

The total assessed valuation of the State for tax purposes is \$2,033,302,482. The tax rate for State purposes for 1939 is set at 2.61 mills, which is calculated to produce \$5,344,026. The biennial budget for 1939-41 carried appropriations of \$51,436,114, of which about \$12,500,000 are Federal funds. The chief sources of State revenue, aside from the direct tax on property, are the tax on gasoline, motor vehicle licences, taxes on liquors and miscellaneous fees and licences. There is no State tax on personal or corporate incomes or on sales. The inheritance tax is collected by the counties. The State has no debt, though that of the local subdivisions in 1938 amounted to \$71,000,000. This does not include debts of the Public Power and Irrigation Districts amounting to \$60,000,000.

Agriculture and Manufactures.—Nebraska is an almost purely agricultural State and its chief products are from the soil. Its most valuable products are cereals and livestock. The normal production of corn is nearly 250,000,000bu. and of hogs more than 5,000,000 annually. Other important crops are wheat, oats, hay, potatoes and sugar beets.

The chief industries of the State are connected with the processing of farm products. The meat packing industry of Omaha involves 12 establishments, turning out products valued at \$109,419,614. Next in order of their importance come the processing of milk, flour, feed and mill products; car and car repairing, and such minor industries as confectionery, leather and harness, lumber and millwork and concrete products. In 1937, 24,480 persons were gainfully employed in 1,071 manufacturing establishments and the value of manufactured products was \$282,502,287.

(L. W. L.)

Necrology: see OBITUARIES.

Negroes (American). The civil rights campaign for removal of disabilities of racial discrimination has continued significantly. After the 1938 U.S.

Supreme Court decision, ordering the State of Missouri to admit Lloyd L. Gaines to the University of Missouri Law school or provide equal facilities within the State, a separate law school for Negroes, authorized by the Taylor Bill, has been organized at St. Louis as an extension of the State-supported Lincoln university. This has been widely protested, the school premises picketed, and suit is impending to show the facilities offered unequal and therefore, discriminatory. Other Southern States, much concerned by the implications of the Gaines decision, have been increasing appropriations and educational facilities for Negroes. In Maryland, the State has taken over Morgan college, a private institution, as a State college. A few States are now offering graduate and professional studies, some in co-operation with the faculties of the white State universities, others by extension of the programs and staffs of the Negro State schools. Pressure for full facilities and removal of legal disability still continues in legal and popular protest.

Fourteenth amendment pleas before the liberalized courts seem increasingly successful. The Virginia suit for the equalization of teachers' salaries, brought in Norfolk, Va. was lost and has been appealed, but the Annapolis county (Md.) Mill's Injunction case won a favourable decision and the Maryland authorities were ordered to equalize the pay of white and Negro teachers, and acquiesced.

Similarly, there has been increased participation of Negroes in both labour organization and in campaigns for labour rights. Both in A.F. of L. and C.I.O. organizations, increased recognition and activity of Negro workers took place, especially in the C.I.O. unions, where mixed unions are the rule even in Southern jurisdictions. The Brotherhood of Red Cap Porters won a long-standing salary decision before the Labor Relations Board on mandatory wages instead of gratuities from the travelling public. Labour activity has been intensified by the pressure of the depression, from which Negroes have suffered disproportionate employment losses. Growth of labour consciousness accounts also in part. Acute suffering and unrest among urban Negro workers has only been obviated by the Federal and State relief and remedial employment programs. In the rural districts, the situation has steadily grown worse, so that farm tenant evictions, riots and protests have featured the year; especially in Arkansas, Missouri and Oklahoma, where sharecropper conditions have become matters of national publicity and concern. A significant feature has been the frequent joint organization and action of the white and the Negro sharecroppers, sometimes independently, sometimes under the auspices of the Southern Farm Tenants Union. In the relief retrenchments of both State and Federal funds, Negroes have experienced heavy economic set-backs, due to local discrimination and allowance differentials in certain States of the relief allotments.

Educational and Cultural.—*The Crisis* annual survey of education reported a grand total of 3,467 Negro college and professional graduates, 2,890 of whom were trained in Negro colleges with a total of 25,781 students enrolled. Fourteen doctoral degrees and 32 Rosenwald Fellowship and two Guggenheim Fellowship awards showed steady gains in the upper brackets of research and creative scholarship. In the arts especially noteworthy progress took place not only in music and drama, but in the fine arts. The Baltimore Museum of Art held in March a show, very favourably received, of the work of Negro artists. Marian Anderson, world famous contralto, continued her triumphal career with new public recognition in radio and concert, but was denied the use of Continental Hall in Washington by the D.A.R. Board. This discriminatory decision met nation-wide protest, culminating in resignations from that organization which included that of Mrs. Eleanor Roosevelt. As a protest, an open air concert was held in

Washington Easter Sunday at the Lincoln Memorial, 72,000 persons participating in a record-breaking event under prominent patronage and with an introduction by Secretary of the Interior Ickes July 2, at the annual convention of the National Association for the Advancement of Colored People, Miss Anderson was presented her Spingarn medal awarded by Mrs. Roosevelt, who had previously placed her on the White House recital program honouring the visit of King George and Queen Elizabeth, the British sovereigns. Notable recognition came during 1939 to another singer, Dorothy Maynor, soprano, presented by Serge Koussevitsky in Boston and New York with the Boston Symphony orchestra. In the 25th anniversary concerts of the American Society of Composers, Authors and Publishers at Carnegie Hall, an historical review of Negro music featured one evening, with special tribute to W. C. Handy, composer of the "St. Louis Blues." Symphonic as well as popular music was presented. It was established by Kelly Miller that the author of "Carry Me Back to Ole Virginny" was James Bland, a Negro musician of the late '70s. Geo. W. Carver received one of the three Roosevelt medal awards, for his achievements in scientific horticulture and industrial chemistry.

In drama, notable theatre productions of 1939 were *Mamba's Daughters*, by DuBose Heyward, starring Ethel Waters, *John Henry*, by Roark Bradford starring Paul Robeson, and the Chicago Federal theatre production of a jazz version *Swing Mikado*.

In New York city, Jane Bolin was appointed the first woman court judge by Mayor La Guardia, and Judge Myles Paige, previously appointed to the Criminal Division Court was promoted to the Special Sessions Bench. Kelly Miller, famous sociologist and race publicist, died December 29.

In the field of religion, the unification of the Northern and Southern branches of the Methodist Episcopal churches took place and two Negro bishops were assigned jurisdiction over Negro churches. In the Roman Catholic Church a movement for closer inclusion of Negro communicants in churches and church schools without racial discrimination received great impetus from its approval in the first encyclical of Pope Pius XII, who at his first consistory appointed two Negro missionary bishops. (See also ILLITERACY.)

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Neoprene: see STANDARDS, NATIONAL BUREAU OF.

Nepal, a kingdom lying between India and Tibet, is now completely independent, but has the closest association with India, both in commerce and in its recruits for the fine Gurkha regiments of the Indian army. The prime minister is by old tradition *de facto* ruler of the State. The British envoy (Col. G. L. Betham) resides at Khatmandu, the capital city (pop. 80,000). On the outbreak of war in Europe the Government of Nepal offered to send 8,000 Gurkhas for the garrisoning of India. (ME.)

Nervous Diseases: see MEDICINE; PSYCHIATRY.

Nervous System. Localization of specific functions residing within discrete areas of the grey cortex of the brain has become more exact since neurosurgeons have, during the course of operations for brain lesions, systematically stimulated the exposed surfaces of the human brain. Valuable data have been derived of practical value in localizing diagnoses.

Penfield and Boldrey have demonstrated that in epileptic patients habitual abnormal patterns of discharge have been conditioned by repeated attacks indicating how important is early adequate anti-convulsant therapy. The field of electroencephalography has been extended and has become of practical value. Focal lesions may be localized by the presence of large slow delta waves recovered from specific areas of the skull. Epileptics of various types may be differentiated by a specific type of wave. Children with behaviour problems and sufferers from dementia praecox may show epileptoid waves indicating a primary disturbance of brain rhythm. Data are emerging which seem to indicate that the personality and even intelligence of an individual may be roughly mirrored in his brain waves. Vitamin B₁ deficiency which at first seemed only causative of beriberi has now been shown to be the most important factor in producing many types of neuritis. The term has been modified to that of neuropathy because only in a circumscribed group of cases is there actual inflammation. Most of the so-called cases of neuritis are degenerations of the peripheral nerves due to vitamin B₁ deficiency. These include the neuritis in alcoholisms, plumbism, diabetes, pregnancy cachexias, etc. Excellent therapeutic results are achieved by the administration of synthetic vitamin compounds such as thiamin. The psychoses of alcoholics, as delirium tremens, are rapidly alleviated by vitamin ingestion.

The shock treatment, which was first introduced for schizophrenia, has now been extended to the field of the depressions with amazing results. Melancholia even of long duration may be rapidly alleviated by two or three induced convulsions or shocks brought on by metrazol. Even elderly individuals are successfully treated. The effect seems to be largely psychological but improvement of cerebral circulation and release of pent-up tensions are probably other factors in the recovery process. (See also ENDOCRINOLOGY; PHYSIOLOGY; PSYCHIATRY; MEDICINE; VITAMINS.)

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Netherlands, area 13,440 sq.mi.; pop. (est. Dec. 31, 1938) 8,728,560. Chief towns (pop. Dec. 31, 1938) Amsterdam (793,526); Rotterdam (612,372); The Hague (495,518.) Ruler: Queen Wilhelmina; president of the Council of Ministers: Jonkheer Dr. D. J. de Geer; language: Dutch; religion: Christian (1930 census: Dutch Reformed Church: 2,732,333; Roman Catholics: 2,890,022).

History.—Naturally the European conflagration overshadowed all other events in 1939, especially in view of Holland's geographical situation. Quite apart from all questions of right and wrong as between the belligerents, it should be borne in mind that although Great Britain is Holland's best customer, Holland's economic relations with Germany are of great importance to her, a fact which renders her position as a neutral all the more difficult.

A new commercial treaty between Holland and Germany was signed on March 25, the main purpose of which was to effect exchanges of goods equitable to both sides. In April Holland intensified her military precautions and introduced a Government scheme for insurance against maritime war risks. The subsequent sinking of several of her ships—notably the "Simon Bolivar" and "Slidrecht"—amply justified this measure. On May 19, the minister of finance—Mr. de Wilde—resigned on account of differences of opinion relative to the 1940 budget. The state visit paid by Queen Wilhelmina to King Leopold on May 23 was an event of great political importance as it reaffirmed the friendship



THE DUTCH BARRICADED their frontier roads in 1939 with all manner of obstacles to mechanized forces

between Holland and Belgium. Holland continued her great work of peace, namely, the reclamation of the Zuyder Zee. Steady progress has been made during 1939. The north-eastern Polder is now under construction and a new great dyke connects the island of Urk with the mainland.

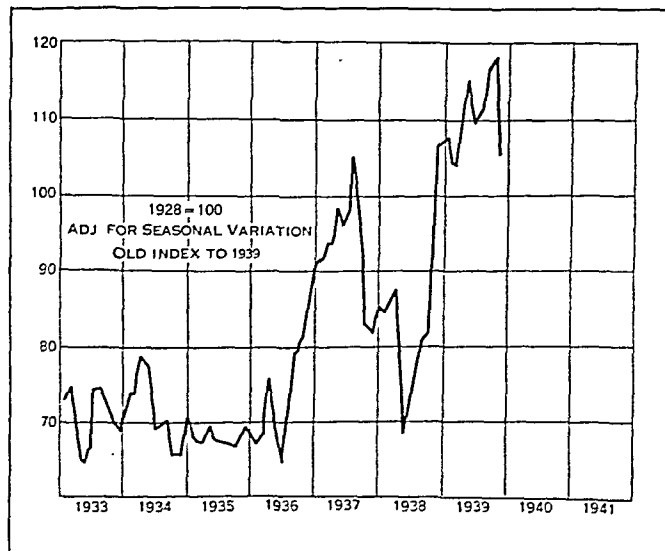
On June 29, the cabinet resigned, after difficulties relative to financial policy. On July 23 the prime minister, Dr. Colijn, succeeded in forming a new cabinet which excluded the Roman Catholics, but a few days later it was voted down by the Second Chamber and resigned. In August Jonkheer de Geer formed a new cabinet which included social democrats for the first time.

The suspension of payments by Mendelssohn's Bank caused a financial sensation and *inter alia* caused considerable losses to a great Netherlands' bank.

On August 24, the statesmen of the Oslo bloc met in Brussels to discuss various problems of common interest. In this month Germany confirmed that Holland's neutrality would be respected in the event of a European war. On September 1 Great Britain did likewise with the proviso that no other power violated its guarantee.

Princess Irene Emma Elizabeth, second daughter of H.R.H. Princess Juliana and Prince Bernhard, was born on August 5.

General mobilization took place on August 28 and Lieut. Gen. Reynders was appointed Commander-in-Chief of the Netherlands



NETHERLANDS: Industrial production index (*The Annalist*)

Army and Navy. Various emergency laws became operative and measures were taken to safeguard Holland's economic position.

On August 29—on the initiative of Queen Wilhelmina—she and King Leopold offered their good services to France, Great Britain, Germany, Italy and Poland, in an attempt to find a way out of the political deadlock. Holland proclaimed her neutrality on September 3.

On November 4 the Netherlands Government published an *Orange Book* relative to various negotiations with the belligerents. On November 9 Queen Wilhelmina and King Leopold again offered to mediate between the belligerents. (C. M. Me.)

Education.—In 1938: elementary schools 7,812: scholars 1,242,778; secondary schools 288: scholars 62,301; high schools (1937-38) 4: scholars 3,037; universities (1937-38) six: scholars 9,471.

Banking and Finance.—Revenue, ordinary (est. 1939) 602,153,493 florins; expenditure, ordinary (est. 1939) 744,732,786 florins; public debt (Dec. 31, 1938) 3,986,628,806 florins; notes in circulation (July 31, 1939) 1,036,976,000 florins; gold and silver reserve (July 31, 1939) 1,153,448,000 florins; exchange rate (average 1938) 8.89 florins=£1 sterling; (July 31, 1939) 8.82 florins=£1 sterling.

Trade and Communication.—Overseas trade (merchandise) 1938: imports 1,414,768,000 florins; (Jan.-Aug. 1939), 983,450,000 florins; exports 1,039,156,000 florins; exports (Jan.-Aug. 1939), 703,710,000 florins. Communications and transport 1938: roads, suitable for motor traffic 16,000 mi.; railways, open to traffic 2,016 mi.; rivers and canals, navigable 4,817 mi.; airways, distance flown 6,629,000 mi.; shipping (June 30) 2,855,400 gross tons; launched (July 1938-June 1939) 246,400 gross tons; entered with cargoes 27,606,524 net tons; cleared with cargoes; 23,151,428 net tons. Motor vehicles licensed (Aug. 1, 1938): cars 94,000; buses 4,088; trucks 50,988; cycles 55,140; wireless (June 30, 1939): registered receiving sets 839,542; connections with radio-distributing-systems 368,710; telephone subscribers (Dec. 31, 1938) 302,808.

Agriculture, Manufactures, Mineral Production.—In 1938, in metric tons, rye 551,060; (1939) 554,000; oats 446,549; (1939) 332,000; wheat 433,762; (1939) 362,000; coal 13,487,524; pig iron and ferro-alloys 299,000; potatoes 2,842,800; barley 140,465; (1939) 130,000; beet-sugar 191,321; butter 103,000; cheese 124,900; flax (fibre) 17,100; superphosphates of lime 569,855; lignite 170,637; wood pulp 105,000; paper and paper boards (1937) 535,000. Industry and labour: index of industrial production (1929=100) (average 1938) 96.1; (average May 1939) 106.3; workers employed in industry (average 1938) 827,000; (May 31, 1939) 930,000; wholly unemployed, registered (average 1938) 303,422; (June 30, 1939) 196,166. (W. H. Wn.)

Netherlands Colonial Empire. Total area (approx.) 845,800 sq. mi.; total population (est. Dec. 31, 1938), 76,401,000. The table lists the mother country and its various possessions:

Country and Area, sq. miles (approx.)	Population est. Dec. 31, 1938 (000's omitted)	Capital	Status	Governors, Premiers, etc.
NETHERLANDS	13,120	The Hague	kingdom	<i>Ruler:</i> Queen Wilhelmina <i>Premier:</i> Jonkheer Dr. D. J. de Geer
ASIA NETHERLANDS INDIES, including Java and Madura, Sumatra, Celebes, Borneo (D.), New Guinea (D.), Timor (D.), etc.	774,600	Batavia	colony	<i>Governor-General:</i> Jonkheer Dr. A. W. L. Tjarda van Starkenborgh-Stachouwer.
AMERICA CURACAO	386	Willemstad	colony	<i>Governor:</i> G. J. J. Wouters.
SURINAM (Dutch Guiana)	57,700	Paramaribo	colony	<i>Governor:</i> Dr. J. C. Kielstra.

Neumann, Heinrich (1873-1939), Austro-Hungarian otologist, was born at Hethars, Hungary on June 16 and studied medicine at the University of Bucharest, later completing his course at the University of Vienna. He began to specialize in diseases of the ear shortly after his graduation from the latter institution, and in 1912 he became chief of the surgical department of the Business Men's hospital in Vienna. In 1918 he was appointed to the faculty of the University of Vienna. Dr. Neumann became famous for his successful operations on the middle and inner ears; his later patients were to include King Edward VIII of England and King Alphonso XIII of Spain. He was arrested in Vienna four days after German troops invaded Austria in March 1938 but was later freed by the Nazis. He went then to Switzerland and, in the spring of 1939, to New York city, where he died November 6.

Neutrality. The status of neutrality, which had almost been abandoned as a legal conception during the years immediately succeeding the establishment of the League of Nations, began to revive in 1931 when the League proved unequal to the task of restraining Japan, and thereafter gradually reacquired its traditional place in international law when Italy successfully defied the League in 1935 and Japan again defied it in 1937. Small States, members of the League, which had hitherto expected to play their part in enforcing the sanctions of the League, began to consider how they might maintain a position of neutrality now that the authority of the League appeared unequal to the task of preventing war.

The United States, which had never renounced the status of neutrality, now sought to protect itself against being drawn into another world war by adopting legislation in 1935 and 1937 designed to restrain its individual citizens from performing acts which, although permissible under the general law of neutrality, might have the effect of giving rise to incidents tending to arouse sympathy for or hostility to one or other of the belligerents and thus create the danger of drawing the country into the war.

In April 1939, with the possibility of war in Europe imminent, new legislation was proposed in Congress and public hearings were held upon a wide variety of bills. Chief among these was the Thomas Resolution, which sought to distinguish between belligerents on the basis of their violation or observance of treaties not to resort to war, forbidding shipments of materials of war to the former and permitting them to the latter. Other bills ranged all the way from complete prohibition of all shipments of war materials to the free sale of them under the traditional rules of international law. Congress adjourned in August without taking action. In the meantime, however, the "cash and carry" provisions of the act of 1937 were allowed to expire by time limit on May 1, 1939, without renewal.

Upon the outbreak of war on September 3 the President issued two distinct proclamations of neutrality, the first based upon the obligations of the United States as a neutral in accordance with the rules of international law and the provisions of domestic statutes in harmony with international law; the second based upon the act of May 1, 1937, the revision of which had been under consideration during the last session of Congress. Congress was summoned in special session, and on September 21 the President delivered a message recommending on the one hand the enactment of legislation prohibiting the ship-

ment of goods to the belligerents in American vessels and requiring the foreign buyer to take transfer of title in the United States, and on the other hand the repeal of the existing embargo on the shipment of arms, ammunition, and implements of war, and a return to the traditional rules of international law.

The "Neutrality Act of 1939."—A joint resolution was introduced in the Senate striking out all but the enacting clause of the Bloom bill, which had been passed by the House during the summer, and containing provisions substantially in accord with the President's recommendations. The resolution provided that whenever the President, or the Congress by concurrent resolution, should find that there exists a state of war between foreign States he should issue a proclamation naming the States and thereafter it should be unlawful for any American vessel to carry passengers or articles or materials to any State named in the proclamation and unlawful for any person to export or transport to any such State articles or materials until all title and interest therein should have been transferred to some foreign Government or national.

Together these two sets of provisions had come to be known popularly as the "Cash and Carry" plan. A later amendment permitted the transport of goods, other than arms and ammunition, to the possessions of belligerent countries in areas other than the North Atlantic and the Mediterranean. "Combat areas" were to be proclaimed by the President, and thereafter it should be unlawful for any American vessel to proceed into or through any such combat areas. American citizens were forbidden to travel on vessels of the States named in the President's proclamation; American vessels engaged in commerce with any foreign State were not to be armed; no person within the United States could purchase or sell the securities of Governments of the States named in the proclamation or make any loan or extend any credit to such Governments, or solicit or receive any contribution on their behalf. Further provisions were designed to prevent the use by belligerents of American ports as bases of naval supply and to restrict the use of American ports by submarines and armed merchantmen. The resolution omitted the specific embargo upon the shipment of arms contained in the acts of 1935 and 1937, so that all goods of whatever character were made subject to the same provisions.

The resolution was debated at length in the Senate, finally passing by a vote of 65 to 30. Debate in the House was briefer, the vote in favour being 243 to 181.

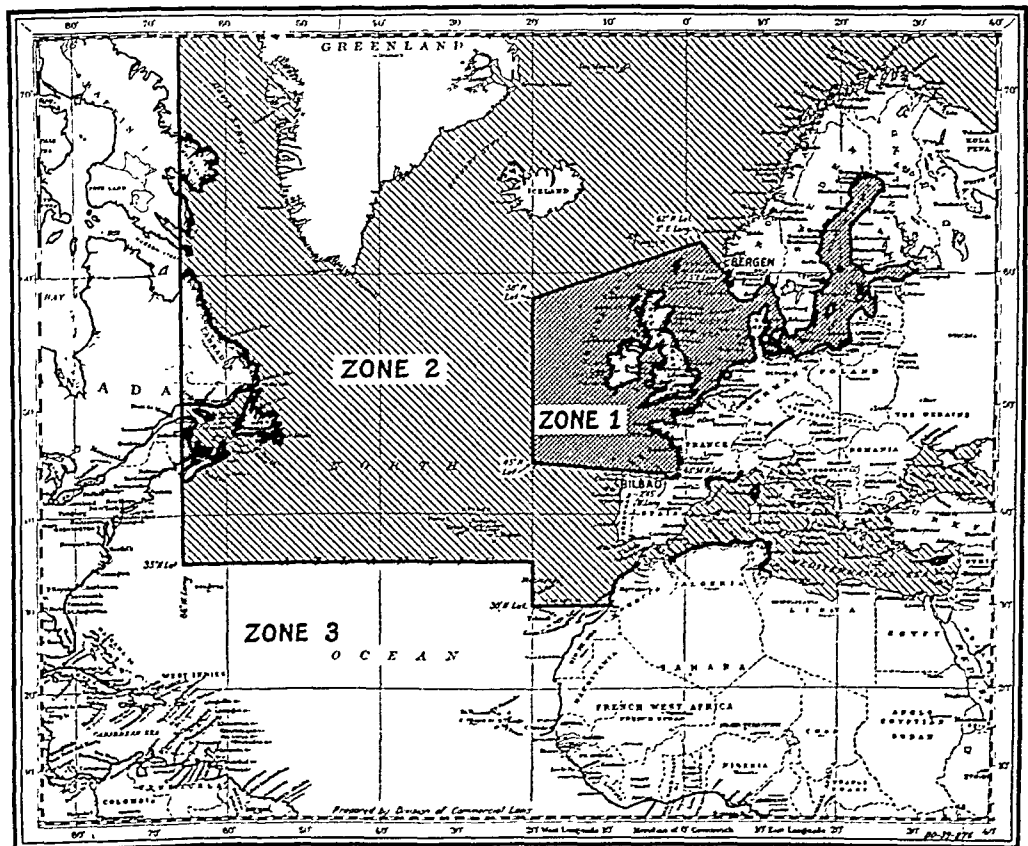
Proposed Transfer of Merchant Ships.—Immediately upon the passage of the law the question arose whether certain American ships belonging to the United States Lines, formerly engaged in trade with the belligerents, might be transferred to the flag of Panama. The proposed transfer was sharply criticised as being an attempt to evade the law, chiefly because the United States Lines, which requested permission to transfer, had a

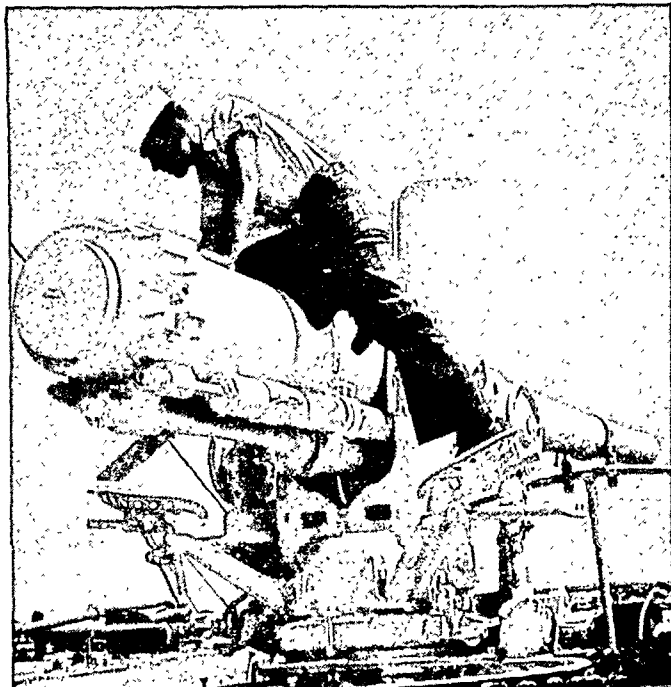
controlling interest in the Panama company. The President, after hesitation, finally ordered the Maritime Commission to forbid the transfer.

Effect of U.S. Legislation.—The importance of the special neutrality legislation of the United States lay in the effect which it was certain to have upon the fortunes of the belligerent States. Just as the restrictions placed upon American shipping and upon the extension of credits to belligerents operated to the advantage of Germany, so the lifting of the embargo upon arms operated to the advantage of Great Britain and France. International law does not require a neutral to adjust its legislation so as to operate with equal effect in respect to the belligerents. Geographic location and control of the sea are permitted to have their natural results. The objection was raised by a number of persons, whether the United States was free to change its neutrality legislation during the progress of a war, when its motive was to aid one side against the other; but this was answered by saying that so long as the United States was acting within its acknowledged rights no foreign nation was privileged to claim that the motive of the United States was any other than that stated by Congress in the law, namely the preservation of its neutrality.

General Neutrality Problems: Submarines and Mines.—In respect to the traditional rules of international law, as distinct from special national legislation, controversies soon arose as to the use by the belligerents of certain instrumentalities and methods of warfare by which neutral States were indirectly affected. Complaints against Germany arose when submarines sank neutral merchant vessels carrying goods alleged to be contraband to the enemy, the justification given by Germany for their destruction being the fact that it was impossible for the submarine to bring the neutral vessel into a German port for condemnation by a prize

U.S. SHIPS AND CITIZENS were forbidden by presidential proclamation on Nov. 4, 1939, to enter waters in a specified "combat area" (zone 1 on the Government map). Ships may travel in zone 2 but must not enter ports of belligerent countries or their possessions unless they carry no passengers or cargo (shorelines indicated by heavy lines)





AFTER ROOSEVELT'S ANNOUNCEMENT Sept. 6, 1939, that the U.S. Navy would patrol the Atlantic and the Caribbean to keep informed of belligerent activities, the work of reconditioning 116 old destroyers for patrol began immediately

court. By November the complaints of neutrals against submarine warfare were supplemented by complaints against the use of automatic contact mines in violation of the rules of international law. Large numbers of neutral merchant vessels were sunk by mines sown near the entrance to the Thames river, and along the eastern coast of Great Britain and in other parts of the North sea. A Dutch vessel, the "Simon Bolivar" of 8,309 tons, an Italian vessel, the "Grazia," of 5,857 tons and a Japanese vessel, the "Terukuni Maru" of 11,930 tons were among others sunk during the second and third weeks of November.

"City of Flint."—On October 9 the United States merchant vessel, "City of Flint," was captured by a German warship for alleged carriage of contraband destined to a British port, and was taken by a German prize crew to the Russian port of Murmansk. The United States promptly called upon the Russian Government to release the vessel by reason of its presence in a neutral port which, under international law, was not permitted to harbour a belligerent prize of war except under conditions of necessity not present in the case. The Russian Government, in spite of protests from the American ambassador, released the vessel to the German prize crew; but when the vessel put into a Norwegian port the Government of Norway interned the German crew and released the vessel to its American crew.

British Contraband Regulations.—In the announcement of its contraband schedules Great Britain retained the distinction between absolute and conditional contraband, placing fuel and instruments of transportation in the first category, but placing food and clothing in the latter category. The distinction, however, quickly broke down when Great Britain resorted to the practice followed during the World War of "rationing" neutral countries adjacent to Germany so as to prevent them from selling their entire domestic production to Germany and making up for the larger sales by increased imports for their own consumption.

The Navicert System.—In order to exercise a more complete supervision over neutral trade with Germany and at the same time to meet the complaints of neutrals over delays due to detention in port for purposes of inspection, Great Britain instituted a sys-

tem of navicerts, by which neutral vessels could submit their cargoes to examination before leaving their home ports and receive from the British consul a document, navicert, which would insure them free progress through the controlled traffic zones. Protests were entered against these navicerts on the ground of subjecting neutral trade to restrictions not authorized by international law.

Submarines and Neutral Ports.—The practical difficulty during the World War of making submarines conform to the laws of war in respect to the safety of the passengers and crew of neutral vessels intercepted by them had led to the adoption of several international conventions condemning their use unless they conformed to the traditional law.

These conventions led a number of neutral States, upon the outbreak of war in September, to consider the advisability of excluding submarines from their neutral ports. The United States neutrality legislation of 1935 and 1937 had made provisions for their exclusion; and on October 18, the President by proclamation denied them the use of American ports except in cases of entrance due to *force majeure*.

Status of Armed Merchantmen.—Likewise deriving from World War precedents, the question arose whether belligerent merchant vessels might arm for defence against submarine attacks without losing their character as commercial vessels in respect to privileges in neutral ports.

The United States Neutrality Act of 1939 also made provision for denial of admission of such vessels to American ports if deemed by the President to be a necessity for the protection of neutral security or commercial interests; but no action was taken in respect to them.

Declaration of Panama.—An important extension of the right of neutral States to be free from the operations of war took place at the meeting of the ministers of foreign affairs of the American republics at Panama, September 23-October 3. The "Declaration of Panama," there adopted, asserts on the part of the American republics a right to have the waters adjacent to the American continent "free from the commission of any hostile act by any non-American belligerent nation." The demarcation of this security zone is put forth "as a measure of continental self-protection." It extends roughly to a distance of 300 mi. from shore, so as to insure not only that hostilities will not be committed near the shore but that inter-American trade routes will not be endangered.

The Declaration announces that the American republics will endeavour "to secure compliance" by the belligerents with the rights thus asserted, and if necessary will consult together to determine upon the measures which they may individually or collectively take to this end.

The General Declaration of American Neutrality.—In addition to the Declaration of Panama the meeting of the ministers of foreign affairs adopted a General Declaration of Neutrality of the American republics, in which the American republics affirmed their "status of general neutrality" and undertook to state "standards of conduct" which they proposed to follow in order to maintain their neutral status and to fulfill their neutral duties. These standards are set forth in a series of rules to be followed; and it was further provided that, with a view to formulating further recommendations based upon experience and changing circumstances, there should be established for the duration of the war an Inter-American Neutrality committee, composed of seven experts in international law. The committee was scheduled to hold its initial meeting at Rio de Janeiro on Jan. 15, 1940.

Case of the "Graf Spee."—Both the Declaration of Panama and the General Declaration of Neutrality were put to the test when on December 13 the German pocket battleship, "Admiral

Graf Spee," after attacking a British cruiser, the "Ajax," which was convoying a French passenger liner, was engaged in battle by two other British cruisers and sought refuge in the harbour of Montevideo. The Uruguayan Government decided to follow the rule of the Hague Convention of 1907 limiting the repairs which the vessel might make to such only as were absolutely necessary to render it seaworthy, and ordered the vessel to leave within 72 hours or be interned.

The commander of the "Graf Spee" then scuttled his vessel rather than engage the enemy forces awaiting him. In view of the fact that the battle was in part fought within the 200mi. mouth of the River Plate and was continued to a point within less than three miles from the shore the Uruguayan Government protested against the violation of its territorial sea. On December 23 the American republics as a body protested to Great Britain, France, and Germany against violation of the "safety belt" defined by the Declaration of Panama. On December 31 it was announced by the Uruguayan Government that the German freighter "Tacoma" must leave port within 24 hours or be interned on the ground that her assistance to the "Graf Spee" on the day the battleship was blown up proved her to be an auxiliary vessel of the German Navy. The following day the vessel was interned.

Changing Concepts of Neutrality.—While the relations between neutral States and belligerent States have during the opening months of the war been governed by appeal to the traditional rules of international law, it is significant that the policies of a number of neutral States have shown many deviations from the more rigid status of neutrality hitherto defined by international law. Italy, for example, although still neutral has not hesitated to give official expression to sympathy with Germany which is not in accord with traditional law. Russia, although neutral in respect to the war between Germany and Poland, assisted Germany in the conquest of Poland and annexed a share of the Polish

domain. Furthermore, following the example set by Japan in China, Russia not only began hostilities against Finland on November 30 without formally declaring war, but continued to maintain the official position of not being at war, although Finland had announced that "a state of war" existed. In consequence of this anomaly, it was possible for the United States Government to undertake measures of assistance for the Finns, to the extent of a loan of \$10,000,000 by the Government-owned Export-Import Bank, and American citizens sympathetic to the Finnish cause have been able to raise funds for military assistance to Finland without coming into conflict with the provisions of the neutrality laws. (See also CHINESE-JAPANESE WAR: *The European War*; COAST GUARD ACADEMY, U.S.; EUROPEAN WAR; INTERNATIONAL LAW; LEAGUE OF NATIONS; LEGISLATION, FEDERAL; LUMBER; PROPAGANDA; ROOSEVELT, F. D.; SHIPPING, MERCHANT MARINE; SUBMARINE WARFARE; UNITED STATES: *History*.)

(C. G. Fk.)

Nevada, admitted into the Union on Oct. 31, 1864, has two popular names, the "Sagebrush" and the "Silver State"; area 110,690 sq.mi.; population according to the U.S. census of 1930, 91,058, estimated Jan. 1, 1940, 110,000. Capital, Carson City, 1,596. The largest city is Reno, population 18,529. Of the State's population 37.8% is urban; 89.4% white; 6.6% Indian; 3.4% Mexican or Oriental; and .06% coloured. About 83.4% of the population is native and 16.6% is foreign born.

History.—The outstanding event during 1939 was Nevada's Diamond Jubilee Celebration held at Carson City on October 29, 30 and 31, marking the 75th year of Statehood. Legislation passed in recent State legislatures included a workmen's compensation law, child labour laws, a women's minimum wage law and a law to permit open gambling under State licence. Nevada has made no material changes in its tax laws, except the gasoline tax, in 30 years.

The principal State officials were governor, E. P. Carville; lieutenant-governor, Maurice J. Sullivan; secretary of State, Malcolm McEachin; attorney-general, Gray Mashburn; State treasurer, Dan W. Franks; State controller, Henry C. Schmidt; surveyor-general, E. W. McLeod; mine inspector, Matt Murphy; State highway engineer, Robert A. Allen; U.S. Senators, Key Pittman and Pat McCarran; U.S. Representative in Congress, J. G. Scrugham. Chief justice of the Supreme Court is E. J. L. Taber; associate justices are Edw. A. Ducker and William E. Orr.

Education.—The University of Nevada in Reno had an enrolment of 1,125 on Jan. 1, 1940, composed of 702 men and 423 women students. Dr. Leon W. Hartman was inaugurated as president with impressive ceremonies on Dec. 15, 1939. In 1939 there were 253 elementary schools, 14 kindergartens and 47 high schools in Nevada, staffed by 629 elementary teachers, 13 kindergarten teachers and 258 high school teachers. The total enrolment of school children was 19,973.

Charities and Correction.—The State Orphan's Home is located at Carson City; inmates on Jan. 1, 1940, were 51. The State Hospital for Mental Diseases at Reno, on Jan. 1, 1940, had 345 patients. The State Industrial Home at Elko had 63 inmates and the State Prison, Carson City, on Jan. 1, 1940, had 240 inmates.

Banking and Finance.—On Jan. 1, 1940, there was a Treasury surplus of more than \$3,000,000 and no bonded debt except that held within the State. The resources of the 11 insured commercial banks in Nevada totalled \$40,102,000 on June 30, 1939, and deposits were listed as \$36,696,000.

Agriculture and Mineral Production.—According to the latest census there were 3,696 farms in Nevada having a farm population of 15,385. The State has a total farm acreage of 3,621,769 acres.



The principal crop is hay. The number of cattle populating Nevada ranches was listed on Dec. 1, 1939, as 360,000 beef cattle; 21,000 dairy cows; 23,000 hogs and 845,000 sheep; the number of sheep shorn was 774,000, and the shearings totalled 6,192,000lb. of wool.

The mineral production of Nevada in 1938 was valued at \$23,529,064 in gold, silver, lead, copper and zinc—a decline of 32%. Gold production for the year totalled \$10,375,190; silver, \$2,815,658; copper, \$9,049,124; lead, \$430,468; zinc, \$858,624. The production of gold alone showed an increase for the year of 5%. Silver, copper, lead and zinc all showed decreases in production. Nevada retained its position as the principal tungsten producer. In 1938, shipments of concentrates totalled 1,461 short tons, reduced to the equivalent of 60% WO₃. The production of vanadinite was seven tons and no molybdenum was produced in 1938. One carload of manganese ore was shipped. Mercury was produced in a number of counties of Nevada. The total output of the State, however, was only 336 flasks. An estimate of the 1939 output is expected to show an increase, especially in gold, silver, copper, tungsten and mercury production.

In gem stone production Nevada showed increases, during 1938; 8,000lb. of turquoise and turquoise matrix were marketed at \$3 per pound; 39 mines were noted in the State. The discovery of emerald was made early in 1939, but the importance of the find is in doubt. (E. C. D. M.)

Newberry Medal: see AMERICAN LIBRARY ASSOCIATION; CHILDREN'S BOOKS; LITERARY PRIZES; *United States*.

New Brunswick, one of the original Provinces which united to form the Dominion of Canada in 1867; area 27,985 sq.mi.; population, according to the Dominion census of 1931, 408,219, estimated Jan. 1, 1940, 445,000. Capital, Fredericton, 8,830. The only other cities are Saint John, 47,514, the most important port, and Moncton, 20,689, the main divisional point of the Canadian National Railway in the Maritime Provinces. Of the Province's population 263,432 are rural, or 64%; 403,049 are Canadian born or nearly 99%. The present Government assumed office in 1935 as the result of a Liberal victory over the Conservatives.

A provincial election in Nov. 1939, resulted in the return of 27 Liberal as against 21 Conservative members. The lieutenant-governor, who is appointed by the Dominion Government for a term of five years, is the Hon. Murray MacLaren. The Premier and Minister of Public Works is the Hon. A. A. Dysart.

New Brunswick has a system of free schools and the law provides for the compulsory attendance of children but, largely as the result of the presence of a large number of French Canadians in the north and east of the Province, the law is not strictly enforced. This, together with the sparseness of the population, is largely responsible for the fact that nearly 7% of the population can neither read nor write. The enrolment in the public day schools is (1940) 94,179; in private day schools 2,395. There are two universities in the Province, the University of New Brunswick, which is financed and controlled by the Government and has an enrolment of 365, and Mount Allison university with an enrolment of 445. The value of the net production for the Province in 1936 was \$63,573,236, an increase of nearly 4% over the preceding year. The maximum of the 14-year period ending in 1934 was reached in 1928. The high level of that year was followed by four years of decline. The estimated wealth of the Province is \$855,511,000; wealth per capita \$2,118. The net value of manufactured products in 1937 was \$28,770,727, a slight increase over the preceding year. The gross value of agricultural products in 1937 was \$26,517,000. New Brunswick is not an important mineral-

producing Province, the value of the output in 1938 being only \$3,766,265.

New Brunswick is represented in the Dominion Parliament by 10 Senators, appointed for life, and 10 members of the House of Commons, who are elected for five years or less.

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New Deal: see RELIEF; ROOSEVELT, FRANKLIN DELANO; SOCIAL SECURITY; TRADE AGREEMENTS; UNITED STATES: *History*.

New Education Fellowship: see EDUCATION, PROGRESSIVE.

Newfoundland and Labrador. Area: Newfoundland 42,000 sq.mi.; Labrador 110,000 sq.mi.; total 152,000 sq.mi.; pop. (est. Dec. 31, 1938): Newfoundland 290,660; Labrador 4,780. Chief town (capital, pop. est. 1938) St. Johns (41,000). Governor: Sir Humphrey Walwyn, K.C.M.G., K.C.S.I., C.B., D.S.O.; language: English; religion (1935 census): Roman Catholic 93,925; Church of England 92,732; United Church 76,110; Salvation Army 18,054.

History.—The island of Newfoundland off the east coast of Canada, which has sovereignty over the mainland area of Labrador, is a British Dominion with its government as such in suspension since 1933. It is at present administered by a Commission of Government instituted by the Imperial Government.

J. H. Penson, the commissioner for finance, in the course of his budget speech on July 3 outlined an extensive program of reconstruction with which the Government intended to proceed. This would involve the expenditure of some £197,000 on agriculture, £321,000 on roads and bridges, £25,000 on land settlement, £20,000 on medical services, and £20,000 on educational buildings, as well as provision for five additional bait depots and aid for the manufacture of herring meal and oil. The Commission Government introduced its first tax increase by raising the excise on local manufactures of beer, cigarettes, and tobacco.

The year was noteworthy for the visit of the King and Queen on their way home from their tour of Canada and the United States.

Education.—In 1938: schools 1,166; scholars on rolls 62,272; average attendance 43,406.

Banking and Finance.—Revenue, ordinary (est. 1939-40) \$11,381,700; expenditure, ordinary (est. 1939-40) \$13,634,732; expenditure, reconstruction and special (1939-40) \$5,735,208; public debt (June 30, 1938) sterling £20,392,543, Canadian \$625,000; notes in circulation (June 30, 1938) \$44,823; exchange rate as Canadian dollar.

Trade and Communication.—Overseas trade 1938-39 (merchandise): imports \$24,500,000; exports \$31,500,000. Communications (Dec. 31, 1938): roads, main 1,150mi.; secondary and local 6,000mi.; railways, open to traffic 747mi.; motor vehicles licensed (1938): cars 3,966; trucks 1,082; cycles 172.

Mineral Production and Fisheries.—Fisheries (inshore, cod and Labrador) 115,604 metric tons. Seal fishery (1938) \$189,384; salmon fishery (1938) \$368,030; lobster fishery (1938) \$267,923; fish oils (1938) \$189,384. In metric tons: wood pulp 342,000; iron ore (metal content) 890,000; lead concentrates (1938) 42,652; copper concentrates (1938) 33,382; zinc concentrates (1938) 124,036; silver (1938) 47.9; gold (1937) 699 kilograms.

New Guinea: see DUTCH EAST INDIES; MANDATES; PACIFIC ISLANDS, MANDATED.

New Hampshire, one of the original States of the United States, popularly known as the "Granite State"; area, 9,282 sq.mi.; population (U.S. census 1930) 465,7

293, estimated July 1, 1937, 510,000. Capital, Concord, 25,228. Other cities with populations exceeding 20,000: Manchester, 76,834; Nashua, 31,463; Berlin, 20,018. Of the State's population 273,079, or 58.7%, were (1930) urban; 464,350 whites. Of the white population, 381,690 were native born, and 82,660, foreign born. Important foreign-born elements were: United Kingdom 11,539; French Canadians, 37,682; other Canadians, 13,277.

History.—Governor, Francis P. Murphy; secretary of State, Enoch D. Fuller; State treasurer, F. Gordon Kimball; adjutant general, Charles F. Bowen; attorney-general, Thomas P. Cheney (all Republican). U.S. Senators from New Hampshire are H. Styles Bridges and Charles W. Tobey (both Republican). Congressmen are Arthur B. Jenks and Foster Stearns (Republican). The 162nd session of the General Court of the State extended from Jan. 4 to June 17, 1939. Important measures enacted were those authorizing a \$5,000,000 bond issue for construction, reconstruction and maintenance of highways and for reimbursement of towns for hurricane and flood damage; levying a 15% tax on all tobacco products as a means of eliminating the direct tax of \$1,200,000 a year; approving acquisition by the Federal Government of land at four sites in New Hampshire for construction of flood control dams; extending legality of pari-mutuel horse race betting through 1942.

Education.—There are in New Hampshire 1,693 public schools, including 103 approved public high schools; 16 public academies approved as high schools; 5 accredited private academies; 608 private schools; and two teachers' colleges (formerly designated normal schools) at Plymouth and Keene. There are also four institutions of higher education: University of New Hampshire, Durham; Dartmouth college, Hanover; St. Anselm's college, Manchester; and Colby Junior College for Women, New London. There were in 1939 some 198 juvenile camps licensed by the State Board of Health. Total State expenditures for public education, year ending June 30, 1938, \$7,458,043. Last available report of the State Board of Education shows a total of 82,181 public school pupils and 33,037 private school pupils, with a total of 115,218 pupils in all schools.

Banking and Finance.—Savings banks and savings departments of trust companies reported deposits of \$204,464,415, as of June 30, 1939, being an increase over June 30, 1938, of \$3,263,868. There were also 28 building and loan associations with assets of \$11,970,454, an increase of \$293,562 over the preceding year. Cash receipts of State Treasury Department, for fiscal year ending June 30, 1938, \$44,320,965; cash disbursements, \$43,072,192. Net bond and note debt June 30, 1938, \$13,683,000. Average tax rate in 1936, \$34.30 on each \$1,000 of valuation.

Agriculture, Manufactures, Mineral Production.—Major farm products are milk and cream, potatoes, apples, dairy cattle and live poultry, marketed principally in cities of Eastern and Central Massachusetts and New York city. Estimated acreage in 1934, used for crops, 448,000; for pasture, 961,000; woodland, 1,274,000. Lumber production, 1936, estimated at 161,000,000 board feet. Number of farms, 1935, 17,695, with average acreage of 119.6; average value per acre, \$31.64. Principal industries produce textiles, boots and shoes, and lumber and wood products, including paper. Value of manufactures in 1937, \$249,631,724. Electric power generated in 1937, in kilowatt hours: water power, 706,000,000; fuel power, 56,000,000. Estimated direct gross income from recreational facilities within the State, in 1936, \$9,641,503. An important report was submitted in 1939 to the Commission for the Promotion of the Wealth and Income of the People of New Hampshire. It finds that in 1936, the people of the State as individuals saved \$13,761,000, but that the net loss in business, banking and government amounted to \$17,750,000. Of the total State income, 51.5% came from manufacturing; 19.6% from serv-

ice; 13.6% from trade and finance; 9.9% from transportation and communication and 5.4% from agriculture. The report embodies what is claimed to be the first such economic analysis of a State as a unit ever made. A report on industry was also issued by the State Planning and Development Commission, which estimates that between 1933 and 1937, the value of the manufactured products of the State increased by more than 50%. (W. E. Ss.)

New Hebrides: *see* PACIFIC ISLANDS, BRITISH; FRENCH COLONIAL EMPIRE.

New Jersey, described as the "Garden State," was one of the original States of the United States; area 8,224.44 sq.mi.; population according to U.S. census of 1930, 4,041,000, estimated by U.S. Census Bureau, July 1, 1937, 4,343,000; capital, Trenton, 120,000. The largest city is Newark, population 1930, 442,337. Of the State's population in 1930, 1,571,548 were native whites and of native parentage; 208,828 coloured; 1,413,239 native white and of foreign or mixed parentage; 844,442, foreign born. The urban population was 3,339,244, or 82.6%.

History.—The Republican Party in the 1939 elections added to the gains begun in 1938 when W. Warren Barbour was elected to the United States Senate for the unexpired term of Governor A. Harry Moore, Democrat. Only legislative and local offices were at stake, but the Republicans took control of the 1940 legislature by the largest majority since 1930. The House of Assembly will line up with 45 Republicans to 15 Democrats and the Senate will be Republican 16 to 5.

New Jersey joined the States which have turned to race tracks in quest of new revenues. A constitutional amendment, adopted in 1896 to prohibit gambling, was modified at a State-wide referendum to permit pari-mutuel betting at race tracks. Supported by the Democratic State machine and Republican machines in most counties, the referendum was carried by 152,000 votes. When the year 1939 ended, however, no race tracks were operating in the State because the legislature had failed to agree on the proper form of racing control and no racing commission had been appointed because of a fight between the Senate and the Assembly.

This factional Republican quarrel seriously impeded the work of the legislature and agreement was impossible on most controversial issues. It was not until mid-summer that an agreement was reached on the method of financing relief for 1940-41. Then the legislature authorized a referendum on a bond issue of \$21,000,000, representing the State's share of relief. The referendum was carried by 47,000 votes, largely because the electorate was convinced that municipalities were in no position financially to carry the full load and because no alternative program had been provided by the legislature.

The lack of accord between the Senate and the Assembly was reflected also in the failure to pass promised election reform measures and to compromise overdue taxes owed by New Jersey railroads. The roads offered \$14,263,000 in settlement of arrearages which aggregated approximately \$32,000,000 including interest and penalties. Subsequently the Central Railroad of New Jersey filed a petition in bankruptcy contending this action was necessitated by the failure of the legislature to agree to a compromise. Later Judge Philip Forman in the United States District Court declared the State's formula of taxing railroads to be invalid and the effect of the decision was to cancel approximately \$15,000,000 which the State claimed to be due for 1934-35-36. The controversy between Mayor Frank Hague of Jersey City and the C.I.O. was terminated by the Supreme Court of the United States. The court ruled unconstitutional an ordinance under which the police power was used to prohibit public meetings in streets and parks. The decision upheld an injunction by Judge William Clark

of the Third Circuit Court of Appeals which prohibited Jersey City officials from interfering with the right of free speech and free assemblage.

In 1939 the State's payroll reached an all-time high of \$24,000,000 due to "broader State activities." The State continued its policy of requiring examination of motor vehicles twice a year, at a charge of 50 cents for each inspection. This system was adopted as a safety measure and traffic deaths were approximately 11% under 1938.

Finance.—The net valuation of taxable real and personal property for 1938 was \$5,667,877,713. That was a decrease from 1937 of \$100,425,888. These ratables are made up as follows: Real estate, exclusive of second class railroad property, \$4,815,510,255; second class railroad property, \$197,994,407; personal property, \$718,889,817. The average tax rate for 1938 was \$4.535 per \$100 of valuation. Real estate and personal property specifically exempted from taxation for 1938 amounted to \$1,058,536,661, comprised mainly of schools, churches and charitable properties.

For the fiscal year ended June 30, 1939, New Jersey collected \$160,788,000 in taxes, which did not include unemployment compensation taxes.

Agriculture and Manufacturing.—Weather conditions in 1938 were generally unfavourable and crop production in New Jersey declined accordingly. The total crop of grains, potatoes, hay, berries and vegetables fell from 56,129,000 units (generally bushels or crates) in 1937 to 50,500,000. Prices were below the previous ten-year average. Prices stood at 77 cents per unit, three cents less than in 1937 and 15 cents below the preceding 10 years. The estimated value of the 1938 crop was \$41,819,000 and of livestock \$51,245,000. (A. J. S.)

New Mexico, the fourth largest State in the South-western United States, popularly known as the "Sunshine State"; area, 122,634 sq.mi.; population according to the U.S. census of 1930, 423,317 (official estimate July 1, 1937, 422,000). Capital Santa Fé, 11,900. Albuquerque is the only larger city, 27,200. Of the State's population 106,816 are urban, or 25.2%; 331,755 white; 59,340 Mexican; 28,941 Indian.

History.—The Administration, legislature and congressional representation of New Mexico is Democratic. The chief officers of State elected for two years are: governor, John E. Miles; lieutenant-governor, James Murray, Sr.; secretary of State, Jessie M. Gonzales; auditor, E. D. Trujillo; treasurer, Rex French; attorney-general, Filo Sedillo; superintendent of public instruction, Grace J. Corrigan; commissioner of public lands, Frank Worden. The national representatives are Senator Carl A. Hatch, Senator Dennis Chavez and Representative John J. Dempsey.

Education.—For the school year 1937-38 public schools cost \$9,001,045 for 129,877 children. The State also supports the University of New Mexico, College of Agriculture and Mechanic Arts, Normal university, School of Mines, Normal school, Eastern New Mexico Junior college, Spanish American Normal school, and the Military Institute.

Charities and Correction.—State charitable institutions are: School for the Deaf, School for the Blind, Home and Training School for Mental Defectives, Industrial school, Girls' Welfare school, Insane Asylum, Miners Hospital, penitentiary and the Carrie Tingley Crippled Children's Hospital.

Banking and Finance.—On June 30, 1939, there were 41 banks with total deposits of \$57,054,000. The assessed valuation of New Mexico is \$312,442,485. Total State revenue receipts for the fiscal year ending June 30, 1939, were \$22,608,766.52. A 5¢ gasoline tax yielded \$4,570,713.76; a 2% sales tax, \$3,451,997.95; and a 5.60 mills general property tax, \$1,877,488.00. An estimated \$80,000,000 was spent by tourists.

Agriculture and Mineral Production.—The leading farm products were: gr. sorghums, 4,725,000bu.; wheat, 2,960,000bu.; corn, 2,552,000bu.; beans, 643,000 bags; cotton, 97,000 bales. In 1938 there were 1,190,000 head of cattle, worth \$36,129,000, and 2,334,000 sheep worth \$11,906,000.

Mineral production for 1939: copper, \$9,549,904; zinc, \$3,362,108; gold, \$1,294,685.

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New South Wales. Area 309,432 sq.mi.; pop. (est. March 31, 1939) 2,742,859. Chief towns (pop. est. Dec. 31, 1938): Sydney (1,288,720); Newcastle (115,660). Governor: Capt. the Rt. Hon. Lord Wakehurst, K.C.M.G.

History.—On February 28 B. S. B. Stevens achieved a record term of office as premier of New South Wales. In August, however, following a sharp disagreement on financial policy with Mr. Spooner, minister for works and social services, his government was defeated and resigned. A. Mair became premier at the head of a reconstructed Cabinet which included Mr. Bruxner (deputy premier and minister for transport), Sir Henry Manning (attorney-general and vice-president of the Executive Council), Mr. Drummond (minister for education), Mr. Treatt (minister for justice), Mr. Primrose (acting minister for health), Mr. Gollan (minister for labour, industry and social services), Mr. Reid (minister for agriculture), Mr. Tonking (chief secretary), Mr. Vincent (minister for mines and forests) and Mr. Manfred (assistant minister).

The State Labour Party also suffered from internal strife. The revolt of Mr. Heffron and his followers against Mr. Lang's leadership provoked an inquiry by the Federal Executive of the Australia Labour Party, which recommended a conference of both sections of the party. The Heffron group were favourable, but Mr. Lang strongly opposed interference from outside. The conference took place in August, and resulted in the overwhelming defeat of Mr. Lang, and the election of W. J. McKell as leader of the party.

In estimating a budget deficit of £1,502,309 for the financial year 1939-40 the treasurer announced increases in company taxation, taxation of individual incomes and taxation of motor vehicles, which together were expected to yield additional revenue amounting to £3,900,000. The deficit of £2,448,674 for 1938-39 was larger than anticipated, principally owing to higher railway costs.

Pastoral and agricultural areas suffered from drought conditions early in the year, but there was some improvement later. The autumn lambing was below expectations. Damage from bush-fires and heat in January was estimated at £300,000. On August 18 the premier, Mr. Mair, inaugurated the Deniboota irrigation scheme, built to serve 1,400,000 acres of the Murray river area. Secondary industries continued to thrive, and the Broken Hill Proprietary company declared a record profit at its annual meeting. New industrial enterprises included the formation of a £1,000,000 company for the production of aluminium. (L. R. Mc.)

Education.—In 1938: public schools 3,317; teachers 13,134; scholars on roll 367,052; average attendance 300,768; expenditure by State £5,000,000; private schools 746; scholars 100,720.

Finance.—In 1937-38: revenue £54,346,000; expenditure £54,292,000; debt outstanding (June 30, 1938) £354,299,000.

Communication.—Roads (March 30, 1937) 46,108mi. fit for motor traffic. Railways, Government (June 1938) 6,114 miles. Tramways (June 1938) 188 miles. Motor vehicles licensed (June 30, 1939): cars 216,050; commercial vehicles 84,175; cycles 24,151; buses 777; taxi-cabs 1,313. Wireless receiving set licences (June 1938) 403,978. Telephones (June 1938): exchanges 2,004; instruments connected 244,590.

Agriculture and Mineral Production.—Production in 1937–38: wheat 55,104,000bu.; butter 120,883,000lb.; wool greasy 495,027,000lb.; maize 3,403,000 bu.; coal (1938) 9,570,530 tons; gold (1938) 88,698 fine oz. Industry and labour: average number of employees in factories (1937–38) 224,861; employment (June 1939) 93.7%.

Newspapers. War news led the newspaper story of 1939—war news gathered and transmitted from rapidly shifting centres of distant military, naval, aerial, and diplomatic activities—Spain, Czecho-Slovakia, China, Poland, France, the North sea, and finally Finland—war news confused by new kinds of governmental propaganda, censorship, and short-wave radio gestures. Europe's long "war of nerves" changed on September 1 to "war of military surprises"; instantly the European news machine which the American press had been building for 20 years went into high speed, with American newspapermen in every focal centre sending eye-witness stories that made war correspondents' "by-lines" familiar to the entire American public. As press and radio co-operated, Americans in most remote hamlets watched the great show, blow-by-blow, shot-by-shot, in a way that no other people had ever before watched the daily manoeuvres in a distant war. United in a way perhaps never seen before, American newspapers endeavoured to handle the news in such a manner that the United States should not join the war, that the press should not be accused of leading the people into war, and that readers should not be victims of foreign propaganda in spite of strong sympathies. Such was the theme of almost every newspaper meeting. If there was a jingo press, its voice was unnoticed. By the end of four months of war, it was evident that the much-feared censorship and propaganda of opposing powers were relatively harmless—the two cancelled each other out. This was because the new media of wireless communication opened a free flow of news from both sides of the conflict, unlike the one-sided coverage resulting from cable control during the World War of 1914–18. Significantly, the large "listening staffs" set up by press agencies to glean elusive facts from foreign short-wave radio were shortly disbanded as useless.

It is difficult to express graphically the size of the war news machine that served America. Mainly it was a co-operative effort of newspaper-controlled press associations, rather than the activity of individual newspapers; the entire daily press, large or small, carried the entire story, with no one newspaper leading in "scoops" or accuracy. The Associated Press had more than 100 American-trained reporters in Europe, directed from London by Milo M. Thompson and aided by 2,500 native "string correspondents" and tipsters; the United Press had 500 correspondents in Europe, led by Ed. L. Keen and Webb Miller; the International News Service, smaller but manned by numerous star war men, was directed by Barry Faris in New York. Each of the three agencies reported daily European files ranging from 25,000 to 40,000 words; their daily costs doubled, ranging up to \$6,000, far more than in 1914–18. Press traffic of cable and radio increased 40%. In October the U.P. levied a war assessment of 12½% on its newspaper clients; I.N.S. raised its rates 15%; A.P. charged 5 to 25% extra for news released for radio broadcast. Cable handicaps soon shifted the news centre from London to New York, and shortly Britain received French news via New York. War photos came with the news, by cable, radio, and clipper plane, dozens a day at a cost of \$75 each.

Newspaper circulations rose 3% to 4%, partly regaining the losses caused by raised prices in 1938; on some days millions of war extras were sold. Radio news broadcasts, based on newspaper enterprise, were facilitated when in May the Associated Press relaxed its rule forbidding broadcast of its dispatches.



A MILESTONE in newspaper illustration was the perfection of cabled photographs between Europe and the U.S.A. in April 1939. This test "cable photo" was transmitted from London to New York city April 1 in 20 minutes

With war news leading, the biggest stories of 1939—gauged by newspaper space involved—were so numerous that experts differed widely in listing them. The United Press announced this list, after polling 1,000 client editors: (1) Declaration of war on Germany by England and France; (2) Invasion of Poland by Germany and Russia; (3) Russian invasion of Finland; (4) Russian-German non-aggression pact; (5) Visit of British King and Queen to America; (6) Death of Pope Pius XI and election of Pius XII; (7) Disaster of U.S. submarine "Squalus," followed by loss of British "Thetis" and French "Phenix"; (8) Special neutrality Congress, repealing arms embargo; (9) German annexation of Czecho-Slovakia; (10) Sinking of British liner "Athenia"; (11) Munich beer hall blast 10 minutes after Hitler's exit; (12) German capture of U.S. ship, "City of Flint." To these, other news agencies added: Scuttling of German pocket battleship "Admiral Graf Spee"; Beginning of regular trans-Atlantic air service; Adoption of peace-time conscription in England; Peace pleas of President Roosevelt, Queen Wilhelmina of Holland, and King Leopold of Belgium; German use of mystery magnetic mines; Chilean earthquake; Franco victory in Spanish civil war; Conviction of Tammany leader James J. Hines; and Seizure of Albania by Italy. Looking back over the period, 1930–40, the Associated Press listed as the ten best decade stories: (1) Allies' declaration of war on Germany, 1939; (2) Lindbergh kidnapping, 1932; (3) Abdication of Edward VIII, 1936; (4) Roosevelt bank holiday, 1933; (5) Diplomatic Victory of Hitler at Munich, 1938; (6) Birth of Dionne quintuplets, 1934; (7) Repeal of Prohibition, 1933; (8) Death of Will Rogers and Wiley Post, 1935; (9) British royal tour of America, 1939; and (10) Assassination of Huey Long, 1935.

Because of mounting labour costs, paper prices, and taxation, plus declining advertising income, 1939 brought another large casualty list among daily newspapers; at least 51 suspended, merged, or became weeklies. Several blamed Guild and other strikes. Losses in the Hearst string were: *Chicago Herald-Examiner*, *Milwaukee News*, *Atlanta Georgian*, and *Syracuse Journal*. The Scripps chain suspended *San Diego Sun*, *Oklahoma News*,



"WAR-BLINDED." Packer's protest in *The Daily Mirror* of New York city against international censorship of war dispatches in 1939

Spokane Press, and *Portland (Ore.) News-Telegram*. Other leading dailies that closed were *Chattanooga News*, *Wilkes-Barre Evening News*, *Minneapolis Journal*, *Buffalo Times*, *Rochester Evening News*, and *Newark Star-Eagle*. The number of weeklies, however, increased by at least 25. Analysis over a long period showed the loss of competing dailies offset by new dailies in cities under 10,000 people; the one-newspaper cities had increased from 353 in 1899 to 1,083 in 1939.

The year 1939 saw little improvement in newspaper finances. War increased costs without raising income. Advertising income, down 34% since 1929, rose slightly (about 2%) during the fall but not enough to offset high paper and machinery costs, shortening of hours and raising of wages to a level 30% above that of 1929. Newspaper executives bewailed increased taxation, unemployment and social security levies, and other new costs imposed by Government. The American Newspaper Guild, at its sixth annual convention, held in San Francisco, reported a membership of 18,755 (including 13,727 in news staffs and 5,028 in business offices), as compared with 16,797 (including 13,505 news and 3,293 business) the year before. It waged fewer strikes, most notable of which were the year-long *Chicago Herald-American*, the city-wide *Wilkes-Barre*, and the shorter *Hollywood Citizen-News* battles. The death of Heywood Broun on December 18 removed the Guild president and leader. (G. M. Hy.)

Great Britain.—In Great Britain conditions in the newspaper industry approximated generally to those of the magazine. The difficulties of 1938 were intensified before the close of 1939; rising costs, lack of confidence, and grave uncertainty acted as a brake on the development of old-established businesses and the creation of new enterprises alike, and although the mortality among journals was on a lower scale than that of the magazines their restrictions in size were even more marked—as is exemplified by the fact that whereas the pre-Sept. 1939 average number of pages in an issue of the *Times* was nearly 28½, in December it had fallen to below 15¼.

Among the casualties of the year the chief were the *Sunday Referee* and the *Leeds Mercury*. The former was established in London (as the *Referee*) in 1877, and for long maintained a brilliant reputation under G. R. Sims, especially in the theatrical and sporting worlds; latterly, changed in format and content as well as in name, it had been owned by the film magnate, Isidore Ostrer, from whom it was bought by Lord Kemsley and amalgamated with his *Sunday Chronicle* in June. In September the *North Mail* (founded 1923) was merged with the *Newcastle Journal* (1711), and in November the *Leeds Mercury* (1718) with the *Yorkshire Post* (1754), both having been under the same proprietorship. The *Dartford Borough News* was amalgamated with the *Dartford Chronicle*, and the *Sporting Chronicle* (Manchester) with the *Chronicle Mid-day*; while the *Reading Gazette* and *Dumfries and Galloway Courier* announced suspension "for the duration," as did a leading agency, the Central News, Ltd., for all its services except the Parliamentary. Two great national dailies, the *Daily Telegraph and Morning Post* and the *Daily Mail*, relinquished the advertisement revenue of their front page and devoted it to news. (See also ADVERTISING; PHOTOGRAPHY: Applications; PRINTING.)

New York, one of the 13 original States of the Union, popularly known as the "Empire State," covers an area of 49,204 sq.mi. of which 1,550 sq.mi. are water. In 1930 the population was 12,588,066 and in 1939 the estimated population was 13,000,000. Of this total the foreign born number 3,191,549; Negroes, 412,814; and other non-whites, 24,959. The capital is Albany with a population of 127,414. Other principal cities are New York with a population of 7,491,790; Buffalo, 573,076; Rochester, 328,132; Syracuse, 209,326; Yonkers, 134,646; Utica, 101,740; Binghamton, 76,662; Troy, 72,763. Among the great cities of the world New York ranks next to London. The population of the State is 83.6% urban.

History.—At the election on Nov. 7, 1939, Associate Judge Irving Lehman of the Court of Appeals was nominated for chief judge of that court by the Democrats and indorsed by the Republicans, to succeed Chief Judge Frederick E. Crane, who retired on account of age. Because of the long established policy of avoiding a political partisan contest for seats on the bench of this highest court in the State, Judge Lehman was unanimously elected. The legislature, chosen in 1938 for two years when the Republicans gained control of both houses, passed for the second time an amendment to the Constitution modifying the provision which forbids gambling of all kinds so as to permit pari-mutuel betting on horse races in such way as the legislature may prescribe and directing that the State should receive a reasonable revenue from the system. Under the pari-mutuel plan the entire amount bet on a race is pooled and is then divided among the winners in proper proportions less a fee to the agent handling the bets. The existing constitutional prohibition against gambling has been ineffective as the legislature has fixed no penalty for race track betting. The amendment was submitted to the people for their approval at the election on November 7 and was ratified by a vote of about two to one. The majority in its favour in the large cities was overwhelming, while it was opposed in the rural counties, including Saratoga county in which there is a popular race track at Saratoga Springs which attracts thousands of visitors during the racing season. It is estimated that the tax which the legislature is expected to levy will yield \$10,000,000 a year. The State has been receiving \$500,000 a year from a tax on tickets of admission to race tracks. The legislature adopted a budget of \$388,000,000 for the fiscal year of 1939-40 which was \$27,000,000 smaller than the amount recommended by the governor. It levied a tax of two cents a package on cigarettes, or one cent on

every ten or fraction thereof sold at retail. The liquor tax was increased by 50¢ a gallon. An income tax on the salaries of Federal employees was voted. The appointment of a legislative auditor to assist in framing the budget was authorized. Provision was made for free bus transportation and the extension of public health and welfare service to children attending parochial and other private schools. The expenditure of not more than \$1,000,000 a year on a State housing program was voted. Other measures adopted were a constitutional amendment extending the term of senators from two to four years; a reduction to 15% of the cost of removing grade crossings to be levied against the railroads; barring from civil service and teaching positions all persons advocating the overthrow of the Government by force; placing the control of home relief in the hands of the localities; extending the mortgage moratorium to July 1, 1940; making it a misdemeanor to sell merchandise not marked with the place of origin and forbidding "loss leaders" in retail trade; eliminating primary elections where there is no contest for a nomination; changing the date of expiration of automobile licences from January 1, to April 1; regulation of hairdressers, cosmetologists and barbers; permitting banks to close on Saturdays in July and August; permitting osteopaths to perform minor surgical operations and administer drugs when properly qualified; prohibiting members of alien organizations from wearing uniforms resembling those worn in foreign countries; providing for the equal representation of men and women on political party committees; advancing \$900,000 for Federal flood control projects on condition that the money be returned to the State. Among the bills which failed of passage were those providing for compulsory automobile insurance and permanent revocation of licences for drunken driving; universal finger-printing; permitting a verdict of five-sixths of the jury in non-capital criminal cases; making daylight saving mandatory from March to October; reducing from 65 to 60 the age of those eligible for old age pensions; a State wide sales tax for relief; prohibiting private development of water power sites and control of outdoor advertising. The constitutional amendment lengthening the term of senators will have to be passed again before it is submitted to the voters for their approval.

The principal officers of the State are, governor, Herbert H. Lehman, Democrat; lieutenant governor, Charles Poletti; attorney general, John J. Bennett; commissioner of education, Frank P. Graves; secretary of State, Edward J. Flynn; commissioner of corrections, Edward S. Mulrooney; superintendent of banking, William P. White.

Education.—According to the statistics for 1939, there are in the State 10,578 public schools with a total registration of 2,260,652 pupils, instructed by 82,454 teachers. There are 986 high schools with a registration of 714,606 pupils, taught by 25,200 teachers. The cost of supporting the schools is \$354,109,166.20 of which about \$115,000,000 is paid by the State. In addition to the public schools there are 86 colleges and universities in the State. For several years there has been dissatisfaction with the policy of the State in contributing toward the support of the public schools and thus lightening the burden on the local taxpayers. The Board of Regents of what is officially known as the University of the State of New York appointed a committee at its meeting on July 28, 1939, to determine whether the amount of State aid is adequate or excessive and what if any changes should be made in the existing practice.

Correction.—On June 30, 1939 there were 14 institutions under the direction of the department of correction with a total population of 17,176. On that date there were 2,826 inmates in Sing Sing prison; 2,214 in the Attica prison; 2,066 in Clinton prison; 1,667 in Auburn prison and 1,291 in Great Meadow prison. The cost of maintaining the 14 correctional institutions for

the fiscal year ending June 30, was \$10,013,447.77, or about \$582 per capita.

Finance.—Total appropriations for the fiscal year, 1939-40, were \$391,730,241.38. Included in this amount was \$104,729,671.28 for current expenses, \$11,938,763.77 for general charges, \$19,778,600 for capital outlays, \$29,383,474.82 for debt service exclusive of interest on relief bonds, \$140,613,585 for State aid, \$85,286,146.83 for unemployment relief including \$25,368,746.53 for interest on relief bonds. No appropriation was made for \$550,000 for interest on temporary loans to meet the deficit for 1938-39 of \$28,826,403.35. The total obligations for the fiscal year, including the deficit, amount to \$421,106,644.73. The estimated revenues are \$420,379,126.52. The State has a gross debt of \$671,731,000 consisting of \$233,500,000 sinking fund bonds and \$438,231,000 serial bonds. The sinking fund contains \$145,947,430, making the net debt \$525,783,569.

Banking.—There were in the State on June 30, 1939, 1,202 financial institutions incorporated under the banking laws of the State or under the supervision of the banking department. Included in this number are 131 State banks, 162 trust companies, 15 industrial banks, 9 private banks and 134 mutual savings banks. The total deposits in all these institutions on that date were \$16,064,170,537 credited to 10,298,861 depositors. The total capital was \$686,581,204 and the total resources were \$19,447,768,225. Included in the number of institutions reporting to the banking department are 211 building and loan associations with resources of \$259,206,474 of which \$230,944,909 is due to shareholders. On June 30, 1939, in addition to the banks under State control, there were 427 national banks with a total capital of \$281,936,000, deposits of \$6,226,339,000, and assets of \$7,120,224,000.

Communication.—On Jan. 1, 1939, there were in the State 84,270 mi. of highways of which 54,998 were improved. Under State supervision are 13,991 mi. of which 12,731 are paved with concrete, brick, or a bituminous material. The other improved roads belong to county and township systems. During 1938 the highway division of the department of public works obligated itself to spend for maintenance or reconstruction of roads \$25,183,349.54 which included \$9,870,473.42 contributed by the Federal Government.

Wealth and Income.—The assessed valuation of taxable real estate in the State according to the latest report was \$25,548,805,000 which under the system of assessment represents a value of \$30,254,215,000. The total income of the people of the State is estimated at \$10,440,000,000. According to the Federal census of 1935 there were then 177,025 farms with a total acreage of 18,185,741. The land and buildings were valued at \$1,045,391,981, and the live stock was worth \$222,250,942. The farm population was 784,483. According to the latest available figures the State produced 7,533,000 bu. of wheat valued at \$4,750,000; 26,888,000 bu. of oats valued at \$8,744,000; 4,307,000 bu. of barley valued at \$2,067,000; 5,436,000 tons of hay, valued at \$39,139,000. Besides these the farms of the State produced 1,620,000 lb. of tobacco; 9,800,000 bu. of apples; 56,000 tons of grapes, 26,840,000 bu. of potatoes and 100,449,000 lb. of dry edible beans. (G. W. Do.)

New York City. At the election in Nov. 1939, members of the city council were chosen for the second time under the proportional representation system. Each of the five boroughs in the city is entitled to one councilman for every 75,000 votes cast and an additional councilman for a surplusage of 50,000 or more. The outgoing council contained 26 members, but because of the smaller vote polled this year only 21 of the 101 validated candidates received the requisite number of votes to be elected, including 18 of the sitting councilmen. The new council contains 14 Democrats, 2 Republicans, 2 American Labor party

members, 2 Fusion-Citizen party members, and one elected as an independent who is a Democrat. The opponents of Mayor La Guardia, who belongs to the American Labor party, have a two-thirds majority and can override his vetoes if they vote as a unit. They were not strong enough in the retiring council to block the mayor's will in this way. In addition to electing a majority of the members of the city council the Democrats elected all the municipal court judgeship candidates in Manhattan, Brooklyn and Queens boroughs, 9 supreme court justices and three justices of the city court. Jonah J. Goldstein, however, was elected to the bench of the Court of General Sessions over the opposition of Tammany Hall. In Brooklyn, where there have been charges of corruption in the administration of justice, a Fusion candidate was nominated for district attorney in opposition to William O'Dwyer, the Democratic candidate. O'Dwyer, however, was elected and he announced that he would co-operate with those who have been inquiring into the charges of corruption. The conviction of James J. Hines, a Tammany leader, by District Attorney Dewey in Manhattan has had a wholesome effect upon the prosecuting officers in all the boroughs.

Among the public improvements completed during the year were an airport and a bridge across Newtown creek. The airport, which is at North Beach on Flushing bay in the borough of Queens, was dedicated on Oct. 15, 1939. It covers 558ac. and cost \$40,000,000, of which \$22,000,000 was contributed by the Works Progress Administration. It has four paved runways one of which is 6,000ft. long, and there is a landing stage for seaplanes on the shore of the bay. The Pan American Airways has leased part of the seaplane landing and plans have been made for the use of the port by aeroplanes of the Army, the Navy, and the Coast Guard as well as by privately owned planes. On August 23 the bridge across Newtown creek at Meeker avenue was dedicated. It connects the boroughs of Queens and Brooklyn with its two three-lane roadways. Streets have been opened connecting it with the plaza of the Brooklyn bridge and with the Queens boulevard in Queens, thus providing an uncongested route for through traffic. The bridge with its approaches cost \$13,194,399. The mayor advanced his housing program and perfected negotiations for the purchase of the privately owned rapid transit lines. He has built new health centres and new markets and has hastened work on a new reservoir to enlarge the available water supply. The reservoir is to be formed by damming Roundout creek in a valley in the southern slope of the Catskill mountains. It will cover about 10 sq.mi. and have a maximum capacity of 50,000,000,000gal., supplementing the Croton and Ashokan reservoirs which have a maximum capacity of 233,000,000,000. The water will be carried to the city through a tunnel dug under the Shawabgunk mountains and the Hudson river. The dam, 200ft. high, is to be completed in 1945.

The Hospital Council of Greater New York, appointed in 1935 to study all proposals for expansion of the hospitals in the city or proposals for any changes, reported on Nov. 19, 1939, in favour of spending \$2,967,000 for the reconstruction of Roosevelt hospital, and the merger of the Beekman street and Broad street hospitals, all three in Manhattan. A construction program costing \$2,100,000 for Lebanon hospital in the Bronx and the abandonment of the Trinity hospital in Brooklyn were recommended. An international fair in celebration of the 150th anniversary of the first inauguration of Washington was held in the summer attracting hundreds of thousands of visitors to the city. (G. W. Do.)

New York University.

New York University within the year 1939 has added to its plant a number of new buildings involving construction and equipment costs in excess of \$1,400,000. Two of the new buildings, a sani-

tary engineering laboratory on the institution's campus at University Heights and a public health laboratory at the Medical college in the Bellevue Hospital district, were erected by the city of New York on land contributed by the university for the purpose.

A new graduate Institute of Public Law and Administration has been established. Through support of the Alfred P. Sloan Foundation an Educational Film Institute has been created. A four-year curriculum combining liberal arts and technical courses as preparation for careers in the radio industry has been instituted. Two-year programs for the preparation of candidates for the police and fire protection services have been set up.

The enrolment of the university for the year 1938-39 totalled 47,525, the faculty numbered 2,167, and the operating budget approximated \$8,500,000. Gifts received during the year exceeded \$500,000. (H. W. CH.)

New York World's Fair: *see* ARCHITECTURE; ART EXHIBITIONS; ART GALLERIES AND ART MUSEUMS; ELECTRIC LIGHTING; ETCHING; FAIRS AND EXHIBITIONS. *See also* INTERIOR DECORATION; LUMBER; MUSIC; PAINTING; SCULPTURE; TOWN AND CITY PLANNING.

New Zealand, Dominion of. Area: Dominion proper 103,415 sq.mi.; other islands 519 sq.mi.; pop.: Dominion proper (est. June 30, 1939) 1,626,486 (Maoris 88,997); Cook and other Pacific islands (census 1936) 16,350. Chief towns (pop. est. April 1, 1939): Auckland (221,500); Wellington (cap. 175,900); Christchurch (135,000); Dunedin (82,800). Ruler: King George VI; governor-general: Viscount Galway; language: English; religion: Christian (1936 figures, excluding Maoris: Church of England 600,786; Presbyterian 367,855; Roman Catholic 195,261; Methodist 121,012).

History.—The year 1939 opened with a promise of unique progress in social legislation. Parliament had passed, before the general election in the preceding October, the Social Security Act, one of the most momentous pieces of social legislation in the history of New Zealand. It provided old age pensions of 30s. at 60 years of age for both sexes, and amongst other things conferred free medical and maternity benefits, and enlarged the State pensions. The new Social Security proposals automatically came into force on April 1, 1939. The year opened with another internal matter of moment. Shortly before the new year the New Zealand Government had announced the institution of import licences, giving the Government complete control of all imports. The reason was the diminution of sterling credits in London. It was held that this state of financial affairs was due chiefly to a "flight" of capital, the owners of which had been hostile to the Government's social régime, to repatriation of capital left in the Dominion when the exchange rate was raised, and to over-importing. The facts of the removal of capital were given by the finance minister and they were not refuted. There was much opposition to the "control" both in Britain and in New Zealand; but it was a vain endeavour.

The sterling position of New Zealand in London brought the finance minister, Walter Nash, to London early in May. His mission was to deal with "trade relations arising from the changed import situation for financial provision for defence, and to arrange for renewals of loans falling due on Jan. 1, 1940." Before he left for New Zealand, shortly before the outbreak of war, there had been arranged with the British Government satisfactory credits for British exports to New Zealand, for defence and ordinary commercial requirements, and terms had been come to for the renewal of the Dominion's £17,000,000 of loans falling due on Jan. 1, 1940.

An internal loan of £4,500,000 at 4% was floated on May 15, and was over-subscribed. The budget presented on August 1 imposed heavier taxation, but this was largely due to defence requirements. There was in the 1938-39 year a surplus of £800,000 which was greater than anticipated. Good progress was reported with the state housing scheme, the commitments up to Jan. 1, 1940, £10,000,000. Unemployment virtually ceased. An important move was made when the Government took over the control of the Reserve Bank "in conformity with its declared policy of taking control of the credit and currency of the country."

The war cloud hung heavily over the Dominion. Notwithstanding the exceptional political activity and economic reform New Zealand had definitely committed herself to aid, to the utmost extent of her resources, the defence of the British Commonwealth. Early in 1939 a British air mission went to New Zealand; heavy orders were placed in Britain for planes, and ground equipment was greatly extended. A Pacific Defence Conference—Britain, Australia and New Zealand—was held, and though proceedings were not divulged Mr. Savage afterwards announced it had been very successful and helpful and that similar conferences would be held periodically.

During the prime minister's illness, the Hon. P. Fraser became acting prime minister. When Britain on September 3 declared war on Germany, the New Zealand Government immediately followed suit at a midnight sitting, its action being later ratified by parliament. A conference of labour organizations entirely supported the Government. Five days after the outbreak of hostilities, the Government announced the decision to raise a force for defence purposes either at home or where required; recruiting began four days later, strength requirements being exceeded on the first day; and training began shortly afterwards. In London the High Commissioner, W. J. Jordan, was authorized to have New Zealanders in Britain enrolled in a special anti-tank battery, and in a few days 140 men were enlisted and put into camp. In New Zealand the Government offered Britain a voluntary commandeering of all her surplus produce, and this was accepted on an agreed basis. The value of this help from New Zealand can be gauged from the fact that in the World War (1914-18) the Dominion sent overseas to fighting fronts over 100,000 men, and was one of Britain's chief suppliers of meat, dairy produce and wool. Her capacity since then has greatly multiplied. Organizations were set up by the Government to foster the utmost production. Special war finance was provided by additional heavy taxation, the war requirements to the end of the financial year being assessed at £9,750,000, and £20,000,000 for the year. (H.T.B.D.)

Education.—(Dec. 31, 1938) Elementary: state schools 2,290; scholars 205,919; secondary: schools 40; scholars 14,000.

Defence Forces.—(expenditure from consolidated fund):

	Actual		Budgeted
	1937-38	1938-39	1939-40
Navy	£760,529	£835,331	£919,970
Army	529,632	706,753	1,594,468
Air Force	313,652	557,205	700,000

Banking and Finance.—Revenue, consolidated fund (1938-39) £36,582,046; expenditure, consolidated fund (1938-39) £35,772,678; budget estimate (1939-40) £38,243,000; public debt (March 31, 1939) £303,970,272; note circulation, active (Aug. 21, 1939) £11,730,370; reserve (in Reserve Bank, Aug. 28, 1939) gold £2,801,839; sterling £5,690,208; exchange rate: £N.Z.125=£100 sterling.

Trade and Communication.—Overseas trade (merchandise): imports (1938) £55,422,189; (Jan.-Aug. 1939) £36,440,000; exports (1938) £57,800,626; (Jan.-Aug. 1939) £44,438,000; re-exports (1938) £575,657. Communications and transport: roads,

suitable for motor traffic (March 31, 1938) 42,048mi.; railways, open to traffic (March 31, 1938) 3,323mi.; shipping (1938) entered 3,084,705 tons net; cleared 3,102,057 tons net; commercial air transport (1938): aircraft engaged 20; miles flown 1,759,984; passengers carried 60,967; mail and freight carried 472,100lb.; motor vehicles licensed: cars, taxis, etc. 218,870; trucks 52,380; buses 873; cycles 21,259; wireless receiving set licences 317,509; telephones, number of subscribers 155,038.

Agriculture and Minerals.—Values in New Zealand currency in 1937-38: agricultural £8,600,000; pastoral £40,700,000; and dairying, poultry £33,800,000. Production in 1938-39, in metric tons, wheat 151,431; wool 148,644; butter (export, 1938) 132,819; cheese (export, 1938) 81,814; coal (1938) 993,496; brown coal (including lignite, 1938) 1,264,146; potatoes 89,074; oats 47,261; barley 24,421; sheep (April 30, 1939) 31,897,091 head; cattle (Jan. 31, 1939) 4,564,948 head; gold (1937) 5,130 kilograms. (W.H. WN.)

Nicaragua, a Central American republic; language, Spanish; capital, Managua; president, Anastasio Somoza. The area is 49,000 square miles. No census of the country has been taken since that of 1920 which showed a total population of 638,119. Estimates made since that date vary widely, but, unofficial statements from official sources estimate "at least 850,000." The chief cities, with their respective populations (estimated in 1935) are: Managua, 61,679; León, 58,957; Matagalpa, 39,271; Granada, 27,120. The economic situation of Nicaragua continued to be difficult throughout 1938 and 1939 because of the decline in the price of coffee, its principal export. Some immediate improvement is expected in the near future as a result of a promised loan of \$2,500,000 from the Export-Import Bank of the United States. Meanwhile, efforts have been made to combat the rising cost of living through a program of increased Government salaries, control of the prices of essential foodstuffs, and a limit of profits from the sale of prime necessities. In addition, Government housing and public health programs have been instituted. In March 1939, a new constitution was adopted by a constituent assembly called for the purpose. The Assembly re-elected President Somoza for an eight-year term. In May, the president paid an official visit to the United States, and was met in Washington with a reception of unprecedented size. While there he engaged in discussion of a Nicaraguan canal, in addition to receiving financial aid for his country. Earlier in the year proposals made in the United States Congress attracted wide attention in Nicaragua, and the Nicaraguan Government attempted conversations with Costa Rica respecting use of the San Juan river, their common frontier, as part of such a canal. As a result of his mission, a commission of United States Army officers made an investigation of possible canal sites. In October and November, the nationalization of the Bank of Nicaragua and the National railways was begun.

Nicaragua has good external communication by water and by air, but communications within the country are limited. There are 171mi. of Government railway and an undetermined amount of short privately owned lines. The 900mi. highway system is being expanded, and by Aug. 1939, 245mi. of the Inter-American highway system had been constructed. Imports (textiles, machinery and foodstuffs) in 1938 totalled \$5,119,579, a slight decrease. Over half came from the United States, with Germany and Great Britain next. Exports (coffee, gold and bananas) were \$5,884,154, almost 20% less than in 1937. Of this total, the United States took 67.3%, with Germany second. The export commodities, and corn and beans for domestic consumption, are the principal products. The monetary unit is the córdoba, valued at 20¢ U.S. Primary education is free and compulsory, and in 1936 there were over 700 primary schools, with 44,000 pupils. (L. W. BE.)

Nickel. The world total nickel output, 90% of which was from Canada, rose to a new high record level in 1937, with 114,000 metric tons, against 57,000 tons in 1929, but dropped to 112,000 tons in 1938; preliminary figures indicate a new record high in 1939. Of the minor production, New Caledonia averages about 5,000 tons annually; Greece, Burma and Norway range from 1,000 to 1,500 tons; the Soviet Union started production in 1934, and increased to an output of about 2,000 tons; and Brazil, starting in 1933, reached 500 tons.

The United States has no primary nickel production, but turns out 100-500 tons yearly as a by-product in copper refining. The Canadian output dropped slightly in 1938 from its high record level of 102,000 metric tons in 1937 but recovered in 1939 to 103,000 tons.

World consumption was estimated at 112,000 metric tons in 1939, a new high record, an increase of 21% over 1938, and of 3% over 1937, the former high figure. This increase was attributed in part to improvement in heavy industry in the United States, and in part to the general speeding up of industry in Europe, incident to increased war demand. Consumption was distributed 60% in steels, 4% in cast iron and other ferrous alloys, 15% in non-ferrous alloys, 18% in Monel Inconel, and pure metal uses, and 3% in compounds and miscellaneous uses.

One of the centres of interest in the three-ring circus of war is the nickel deposits in the Petsamo district of northern Finland, on which a subsidiary of the International Nickel Co. has spent several million dollars, with the expectation of being ready for production by late in 1940 with a plant capacity of 1,000,000 lb. of nickel and 500,000 lb. of copper monthly. (G. A. Ro.)

Nicotinic Acid: see BIOCHEMISTRY; CHEMOTHERAPY; DIETETICS; PELLAGRA.

Niemoller, Martin: see RELIGION.

Niger: see FRENCH COLONIAL EMPIRE.

Nigeria: see BRITISH WEST AFRICA.

Nitrates. There are small deposits of nitrate-bearing earth or shale in China, Egypt, and Spain, which are locally used to a small extent for fertilizer, and an output of 6,000-8,000 tons of potassium nitrate in India, but the only natural nitrates exploited on an extensive scale are the caliche beds of northern Chile, which carry 10-25% of sodium nitrate, and which supplied the bulk of the world's nitrate requirements for a century. The maximum output attained was 3,238,000 metric tons in 1929, declining to 439,000 tons in 1933, with a recovery to 1,420,000 tons in the fiscal year 1937-38. Steady progress in the development of the synthetic processes was made during the war, and the natural nitrates industry dropped to a point where in 1928-29, according to the figures of the British Sulphate of Ammonia Federation, it furnished only 22% of the world supply, although this was the record year of Chilean output. The depression then took a heavy toll of the Chilean industry, while manufactured nitrogen suffered little, and in 1932-33 Chilean nitrate supplied only 7% of the world total nitrogen supply. Although the Chilean output has shown a heavy increase since 1932, synthetic production has expanded so rapidly that in 1937-38 the Chilean share of the world total supply had increased only to 8%. The synthetic plant capacity now available is far in excess of the total world demand for combined nitrogen. (G. A. Ro.)

Nobel Prizes. The following awards were made during the year 1939:

Physiological Medicine.—Gerhard Domagk of Germany for his discovery of prontosil. The 1938 prize, deferred until 1939, went to Corneille Heymans of Belgium for his research in the role of

the sinus aorta in breathing. Both awards were announced October 26.

Physics.—Ernest O. Lawrence of the University of California, U.S.A., for his work in atom-smashing and his invention of the cyclotron. This award was announced on November 9, as were the awards in chemistry.

Chemistry.—Divided between Adolph Butenandt of Germany and Leopold Ruzicka of Switzerland for their research in sex hormones. The deferred 1938 prize in chemistry was awarded to Richard Kuhn of Germany for his work on vitamins.

Literature.—Frans Eemil Sillanpää of Finland. The award was announced November 10.

The three German prize-winners all declined their awards. German citizens have been forbidden to accept Nobel prizes since the peace award for 1935 was given to the late Carl von Ossietzky. No peace award was made in 1939.

Norris-La Guardia Act: see LAW (CASE): Labour.

North Borneo: see BORNEO.

North Carolina, popularly known as the "Old North State" or the "Tar Heel State;" area, 52,286 sq.mi.; population according to the U.S. census of 1930, 3,170,276, estimated July 1, 1937, 3,492,000. Capital, Raleigh, 37,379; Charlotte, the largest city, 82,675. Of the State's population in 1930, 809,847 (25.5%) were urban; 918,647 (29%) Negroes; 2,251,629 whites; 8,788 foreign born.

History.—The year was characterized politically by unusual apathy and harmony and ended with an unprecedented number of prospective candidates for the gubernatorial contest of 1940. The regular biennial session of the legislature, Jan. 4-March 4, in response to the public demand for cleaner elections, repealed the absentee ballot law for primaries though not for general elections and restricted the use of markers and assistance to handicapped voters in primaries. It adopted the revenue act as a continuing or permanent measure, except as it may be changed by subsequent legislatures. To meet the issue of graduate and professional education for Negroes, the legislature authorized two State Negro colleges to establish graduate and professional courses in liberal arts, agricultural and technical fields, law, pharmacy, and library science; and in September this new policy was inaugurated in part. Without levying any new taxes, the legislature adopted the largest budget in the State's history, the chief increase in appropriations being made for the public schools.

Due to the absence of Federal control, the tobacco crop was of unprecedented size and brought low prices. The withdrawal of foreign buyers due to the war led to the closing of the tobacco markets for a time in September and October. In October the North Carolina tobacco farmers by a vote of over 90% joined with those of the other tobacco States in restoring Federal crop control for 1940; and in December the cotton growers of the State likewise voted by about the same percentage majority, along with those of the other cotton States, to continue Federal control of the cotton crop for 1940.

Important State officers were: Clyde R. Hoey, governor; Wilkins P. Horton, lieutenant-governor; Thad Eure, secretary of State; George Ross Pou, auditor; C. M. Johnson, treasurer; Clyde A. Erwin, superintendent of public instruction; Harry McMullan, attorney-general; W. P. Stacy, chief justice.

Education.—North Carolina maintains separate public schools for whites, Negroes and Indians, with minimum eight months' term and compulsory attendance from 7 to 13 years of age, inclusive. In 1937-38, there were 4,059 public elementary and 946 high schools, with 24,998 teachers and 881,874 enrolment, operated at a cost of \$29,151,402, about four-fifths of which was contributed by the

State Government. The State appropriation for 1939-40 is \$25,941,313. The State maintained three branches of the consolidated University of North Carolina at Chapel Hill, Raleigh and Greensboro, with an enrolment of 15,821 in 1938-39, as well as 12 standard and teachers' colleges (six for whites, five for Negroes, one for Indians). There were 41 private colleges for whites and Negroes. There were 9,565 prisoners in the State prison and various road camps on July 1, 1939; and in August, 33,555 aged persons and 21,064 dependent children received public grants, averaging \$9.59 and \$5.91 per capita, respectively.

Banking and Finance.—In 1938-39, State expenditures were \$142,320,083; receipts \$144,644,358. The assessed value of real and personal property was \$2,311,858,768 in 1938. The State bonded debt was \$152,658,500 on June 30, 1939. There were 41 national banks with deposits of \$99,345,000 and 186 State commercial and industrial banks and trust companies, with \$220,130,000 on June 30, 1939. In 1939 there were 4,751 mi. of railroads, 316 mi. of city bus routes, 6,176 mi. of passenger vehicle routes, and 6,566 mi. of freight vehicle routes; and the State Highway and Public Works Commission maintained 11,232 mi. of State highways and 47,902 mi. of county roads, of which 10,595 mi. were hard surfaced. Federal internal revenue collections of \$326,920,750 in North Carolina in 1937-38 were exceeded only by those in New York, Illinois and Pennsylvania.

Agriculture, Manufactures and Mining.—In 1937, 2,896 manufacturing establishments employed 258,771 wage earners at wages of \$189,266,474 and made products valued at \$1,384,737,686. The leading industries were tobacco, cotton goods, knit goods and furniture. The mineral production in 1938 was valued at \$11,160,444, chiefly granite, sand and gravel, feldspar, mica and ceramics; the kilowatt-hour production of electricity was 2,186,310,000. The total acreage of United States lands in national forests in the State was 927,398 in 1939. The value of the lands and buildings on the 300,967 farms in North Carolina in 1935, approximately half of which were operated by tenants, was \$622,834,983. In 1939, the total value of the 20 major crops increased 8% over that in 1938 to \$231,502,000, of which tobacco, cotton and peanuts accounted for \$156,988,000. For the first time in history, the acreage of tobacco exceeded that of cotton. Tobacco increased 50% in production to 773,810,000 lb. but only 4% in value to \$121,010,000.

Cotton production increased from 388,000 bales in 1938 to 445,000 in 1939 with a value of \$25,804,000.

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North Dakota, North-central State of the United States and popularly known as the "Flickertail State," has an area of 70,837 sq.mi. and a population of 706,000 (estimated July 1, 1939). The capital is Bismarck, population 11,090 (1930). Cities with larger population are: Fargo, 28,619; Grand Forks, 17,112; and Minot, 16,099. Of the population of the State (680,645 in 1930), 113,306 were urban, or 13.6%; 680,477 were white; 368 coloured; 576,058 native born; and 105,155 foreign born.

History.—Principal officers of the State are: United States Senators, Lynn J. Frazier and Gerald P. Nye; Representatives in Congress, Wm. Lemke and Usher L. Burdick; governor, John Moses; lieutenant-governor, Jack A. Patterson; secretary of State, James D. Gronna; State auditor, Berta E. Baker; State treasurer, John R. Omland; attorney-general, Alvin C. Strutz; commissioner of insurance, Oscar E. Erickson; commissioner of agriculture and labour, Math Dahl; commissioner of railroads, Elmer W. Cart; superintendent of public instruction, Arthur E. Thompson; judges of the State supreme court, W. L. Nuessle, chief justice; A. M.

Christianson, A. G. Burr, James Morris, Thomas J. Burke.

Education.—The institutions of higher learning are the State university and school of mines, Agricultural college, three State Teachers' colleges, two normal schools, the school of forestry and the school of science. The total enrolment in these schools was approximately 8,000. The institutions of higher learning are under the unified control of a Board of Higher Education composed of seven members appointed by the governor from a list furnished by an ex officio nominating committee.

Banks.—On June 30, 1939, 121 State banks and one trust company operating within the State of North Dakota, reported invested capital, including \$907,700 debentures held by the Reconstruction Finance Corporation, of \$4,220,107.19 and total resources of \$27,082,499.31. On September 28, 1938, latest date for which information is available, 51 national banks operating within the State of North Dakota, reported a total invested capital of \$5,452,000, which amount included preferred stock held by the Reconstruction Finance Corporation, and total resources of \$52,710,000.

Agriculture, Manufactures and Minerals.—In 1939 there were (estimated) in the State 23,930,032 ac. under cultivation valued at \$521,000,000. The farm income of the State, 1939 (estimated), was \$218,330,652. During 1939 the State produced 43.3% of the national production of spring wheat, 10% of the national flax yield, and 79.3% of the national production of durum wheat. The State ranks first in the amount of wheat stored under Federal loan, 26,811,963 bushels. In the national production of certified seed potatoes the State ranked second with 1,717,571 bu.; the total State production of potatoes was 11,880,000 bushels. In 1938 the amount of lignite coal mined was 2,142,061 tons, valued at \$2,600,643.42. (O. G. L.)

Northern Ireland: see IRELAND, NORTHERN.

Northern Rhodesia: see RHODESIA.

Northern Territory, of Australia; area 523,620 sq.mi.; pop. (June 30, 1938): Aborigines, full-blooded, 14,354; half-caste, 907; white (est. Dec. 31, 1938), 5,645.

History.—The recommendations of the Payne Report, which was published at the end of 1938, were adopted as the basis of a new policy, announced by the Commonwealth Government early in 1939 for the economic development of the Territory. This policy aims at the provision of improved transport services, and of facilities for assisting settlers to develop their holdings. Taxation of income has been abolished for 10 years. It was announced in July that about 250,000 sq.mi. of cattle country would be subdivided into sheep runs of 100-200 sq.mi. as soon as the present leases expire.

The growing importance of Darwin as a port of call for the Empire air services and as a defence base led to considerable development there. Work commenced in Feb. 1939 upon improvements which will include the construction of a new aerodrome and flying boat base and the provision of up-to-date hotel and housing accommodation. (L. R. Mc.)

Finance.—Revenue (1938-39) actual £70,378; (est. 1939-40) £60,000; from Central Australia railway (1938-39) £137,521; from North Australia railway (1938-39) £50,471. Expenditure, ordinary appropriation (1938-39) £402,899; (est. 1939-40) £456,750; new works, buildings, etc. (1938-39) £243,980; (est. 1939-40) £388,000; Central Australia railway (1938-39) £214,374; (est. 1939-40) £202,300; North Australia railway (1938-39) £55,186; (est. 1939-40) £52,960.

Agriculture, etc.—Production in 1937-38; pastoral industry £560,763; gold £93,248; pearl shell £67,000. Railways, Government (Dec. 31, 1937) 508 miles.

Northwestern University was chartered in 1851 as an institution of higher learning. The enrolment of the university for the first semester of 1939-40 consisted of 5,986 full-time students, of which 4,795 were registered on the Evanston campus; and 10,093 part-time and evening students, of which 9,749 were registered on the Chicago campus. The 1939 summer session had an enrolment of 4,579 students.

During the calendar year of 1939, the university received gifts totalling \$8,968,104. The budget for the year 1939-40 totalled \$5,100,000 and the value of all land and buildings used for educational purposes was \$16,930,267. The faculty of the university, including lecturers and demonstrators, totalled 1,475, of whom 688 were full-time members. The university's productive endowment amounted to \$23,062,038.

One of the most important developments during the year was the establishment of the Northwestern Technological Institute, made possible by a gift of \$6,735,000 from the Walter P. Murphy Foundation. Construction is now proceeding on two new buildings: Abbott Hall, a \$1,500,000 18-story dormitory on the Chicago campus; Scott Hall, a \$650,000 student social centre and auditorium on the Evanston campus. Both of these buildings will be completed by Sept. 1, 1940. Plans for two additional buildings on the Evanston campus are now being made, and construction will begin in the early spring of 1940: a new gymnasium to cost \$425,000; the new building of the Technological institute, which will cost approximately \$5,000,000.

Several administrative changes have occurred during the year. Dr. Franklyn B. Snyder became president of the university on Sept. 1, 1939, succeeding Dr. Walter Dill Scott who had been president since 1920. Three new deans were appointed: Dr. Ovid W. Eshbach of the Technological institute, Dr. Homer Vanderblue of the School of Commerce and Dr. Fred D. Fagg, Jr. as dean of faculties.

Northwest Territories embrace all of the mainland, in Canada east of Yukon Territory and north of the Provinces of Manitoba, Saskatchewan, Alberta and British Columbia; all of the islands in Hudson and James bays and in Hudson strait including Ungava bay; and all of the Arctic islands north of the mainland of Canada within the area bounded on the east by a line passing midway between Greenland and Baffin, Devon and Ellesmere islands, to and along the 60th meridian of longitude, to the North Pole, and on the west by the 141st meridian of longitude, to the Pole. In 1918, the territories were subdivided, for administrative purposes, into the provisional districts of Mackenzie, Keewatin and Franklin. The land and water area is estimated at 1,309,682 square miles. The 1931 census shows a population of 9,723, composed of Eskimos, Indians and whites, but as a result of mining activity in recent years the white population has more than doubled.

History.—The Northwest Territories are governed by a Territorial Council composed of a commissioner, deputy commissioner, and five councillors appointed by the Governor General in Council. The Commissioner in Council has power to make ordinances for the government of the Territories under instructions from the Governor General in Council or the Minister of Mines and Resources. The seat of Government is at Ottawa.

Trade and Communication.—The welfare of the native population is one of the chief responsibilities of the administration. Consequently the conservation of the wild life of the region, upon which the natives depend for subsistence, is of prime importance. An aggregate area of 609,277 sq.mi. has been set aside for game preserves and sanctuaries. Licences to hunt and trap outside these preserves may be granted to white residents who are British subjects and who held licences on May 3, 1938.

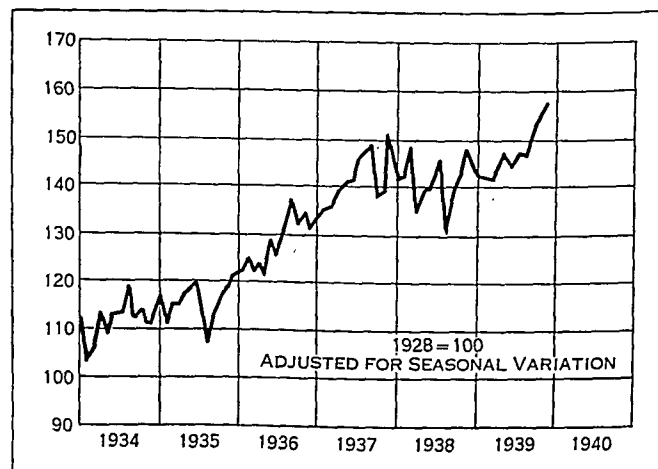
Mining.—Mining of high grade pitchblende-silver deposits at Great Bear Lake continues and ore reserves have been increased. Ore is refined at Port Hope, Ontario. Further gold discoveries have been made in the Yellowknife area, where actual production commenced by the pouring of a gold brick on Sept. 5, 1938, from the "Con" property followed by the pouring of a brick on Feb. 21, 1939, from the "Negus" property in the same locality. More than 7,500 mineral claims were in good standing throughout the Territories on Oct. 1, 1939. (R. A. G.)

Norway, area 124,556 sq.mi.; pop. (est. Dec. 31, 1938) 2,921,000. Chief towns (pop. 1930): Oslo, capital, 253,124; Bergen, 98,303; Trondhjem, 54,458; Stavanger, 46,780. Ruler: King Haakon VII; prime minister: Johan Nygaardsvold; language: Norwegian; religion: Christian (Evangelical Lutheran).

History.—On Jan. 14, 1939, the annexation by Norway was announced of new Antarctic land consisting of that part of coast stretching from the border of the Falkland Islands dependencies in the west to the border of the Australian Antarctic dependency in the east—that is, between 20° W. and 45° E.—together with the land within this coast and its territorial waters. The value of this territory lies in its great importance for the whaling industry.

The resignation of the finance and commerce ministers, Hr. Bergsvik and Hr. Madsen, necessitated a reconstruction of the cabinet on June 30. The former minister of justice, Hr. Lie, took the portfolio of commerce; Hr. Torp exchanged that of social affairs for that of finance; and two Social-Democrats, Judge Wolv and Hr. Stöstad, took over the portfolios of justice and social affairs respectively.

A full measure of the anxiety occasioned by the international situation had to be borne by Norway. In March the president of the Storting, in emphasizing the nation's neutrality, made it clear that she did not require guarantees from any of the great Powers; and when, as a consequence of President Roosevelt's letter to Hitler and Mussolini, Germany asked whether Norway considered herself threatened by her, the foreign minister replied in April that she did not, and that she had neither authorized nor requested President Roosevelt's message; but he added that Norway realized that, if a European war should break out, she would be in danger. A meeting of the prime ministers of Norway, Sweden and Denmark was held on June 18 at Halden, at which the possibility of an economic union of the three countries was considered, but abandoned on the representations of Denmark. After the outbreak of war, the King addressed an extraordinary session of the Storting, on September 8, declaring that the country would remain absolutely neutral. During the rest of the year Norway was concerned



NORWAY: Industrial production (*The Annalist*)

about the repeated sinking of her merchant vessels by German action. She vindicated her neutrality in the episode of the United States steamship "City of Flint," which was released on Nov. 3 by the Norwegian authorities after she had anchored without permission at Haugesund in charge of a German prize crew; the German crew were interned. In November, Norway strongly protested against the British reprisals against German mine-laying methods. The close of 1939 was made increasingly anxious by the fear of Russian invasion following that country's attack upon Finland.

(E. A. ASH.)

Education 1936-37.—Elementary, total number of scholars 357,793; secondary schools 149; scholars 32,101; universities and higher schools, students 5,518.

Banking and Finance.—Revenue, ordinary (est. 1939-40) 556,900,000 kroner; expenditure, ordinary (est. 1939-40) 529,009,000 kroner; public debt (June 30, 1938) 1,428,700,000 kroner; notes in circulation (Aug. 31, 1939) 505,000,000 kroner; gold reserve (Aug. 31, 1939) 236,000,000 kroner; exchange rate (Sept. 1, 1939) 18½-19¼ kroner=£1 sterling.

Trade and Communication.—Foreign trade (merchandise): imports (1938) 1,192,650,000 kroner; (Jan.-Aug. 1939) 820,510,000 kroner; exports (1938) 786,529,000 kroner; (Jan.-Aug. 1939) 506,080,000 kroner. Communications and transport: roads, suitable for motor traffic (1938) 25,713mi.; railways, open to traffic, State (1938) 2,377mi.; shipping (June 30, 1939) 4,835,000 gross tons; motor vehicles licensed (Dec. 31, 1938): cars 51,066; taxis 4,210; buses 3,233; trucks 32,272; cycles 16,876; wireless receiving set licences (Jan. 1, 1939) 364,550; telephone subscribers (Dec. 31, 1938) 119,344.

Agriculture, Manufactures, Mineral Production.—Production 1938 (in metric tons): sea fisheries (1937) 1,012,000; iron ore (metal content) 1,030,000; oats 196,700; (1939) 183,200; barley 124,300; (1939) 126,700; wheat 71,800; (1939) 69,400; potatoes 937,600; coal (Spitzbergen 1937) 766,000; pig iron and ferro-alloys 174,000; whale oil (season 1937-38) 198,000; wood pulp 887,000; copper ore (1937) 30,700; rye 11,000; (1939) 10,400; shipbuilding, tonnage launched 53,000 gross tons; under construction (July 1, 1939) 43,000 gross tons; nitrates of soda and lime (1937) 431,000. Industry and labour: industrial production (1929=100) (average 1938) 127.2; (average June 1939) 139.1; index of employment (1935=100) (average 1938) 109; (June 30, 1939) 114; unemployed, number registered (average 1938) 28,923; (June 30, 1939) 20,802.

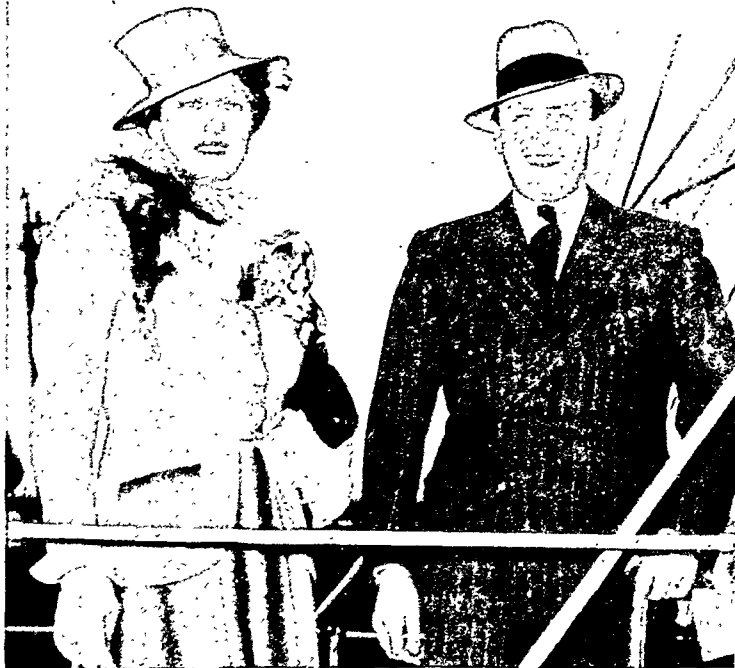
(W. H. WN.)

Nose, Diseases of: see EAR, NOSE AND THROAT, DISEASES OF.

Notre Dame, University of. Outstanding research in the field of economics in 1939 was the work of the Bureau of Economic Research under Rev. Edward Keller, C.S.C. First publication of the bureau, "A Study of the Physical Assets of the United States, Sometimes Called Wealth," attracted wide attention. Also published was a study of the physical assets of the State of Indiana, compiled by James E. McCarthy, Dean of the College of Commerce. A micrurgical colloquium at Notre Dame in November brought to the attention of a national delegation of scholars in the field the great development at Notre Dame in the application of germ-free technique to medicine, bacteriology and general biology. It was led by Prof. James A. Reyniers, equipment was demonstrated, and some of the early results revealed, emphasis being placed on germ-free cubicles for infants, which have successfully prevented disease.

The Knute K. Rockne memorial, devoted to intra-mural athletics and the program of physical education, for all students, was dedicated in June.

A competition, conducted by the Notre Dame department of



CROWN PRINCE OLAF and Crown Princess Martha of Norway visited the U.S.A. in the spring of 1939

architecture, produced interesting designs for the construction of small churches at low cost especially in mission districts. Laetare Medalist for 1939 was Miss Josephine Brownson, president of the Catholic Instruction League of Detroit, whose father, Henry Brownson, received the medal in 1892. New dean of the College of Engineering is Prof. Dugald C. Jackson, Jr., formerly president of Lewis institute. Enrolment for 1939 was 3,279. The year 1939 was the 97th year of the university.

(J. E. AR.)

Nova Scotia, one of the original provinces of the Dominion of Canada; area 21,428 sq.mi.; population, according to the Canadian census of 1931, 512,846, estimated Jan. 1, 1940, 548,000. Capital, Halifax, 59,275. The only other city in the Province is Sydney, 23,089, which is the centre of the coal, iron and steel industries. Of the Province's population, 281,192 are rural or 55%; 507,235 are Canadian born or 97%.

Nova Scotia has a system of free schools and the law provides for the compulsory attendance of children. Text-books are provided free of charge and, in many cases, free lunches are provided. The enrolment in the public day schools is (1940) 116,656; in private day schools 2,977. The number of people who can neither read nor write is 4.26% of the population. There are four universities in the Province: Acadia, having an enrolment of 520 students; the University of King's College, with an enrolment of 65; Dalhousie, with an enrolment of 854, and St. Francis Xavier, with 307 students. King's college is affiliated with Dalhousie. In addition there are an agricultural college and a normal school, both of which are financed by the Provincial Government.

The Liberal Government continued in office with the Hon. A. L. Macdonald, premier, provincial secretary and treasurer of the Province. The lieutenant-governor, who is appointed by the Dominion Government, is the Hon. Walter H. Covert. Nova Scotia is represented in the Dominion House of Commons by 12 members, all of whom belong to the Liberal Party, and in the Dominion Senate by 10 members who are appointed for life.

The net value of production in 1936 was \$89,823,005, an increase of 7% over the preceding year. The net value of agricultural products for the same year was \$16,195,664, a slight increase over the preceding year. The net value of forest products was \$8,537,693; fish and fish products, \$8,202,308; mining products, \$19,108,641; manufactured products, \$27,788,510, a slight decrease in comparison with the preceding year.

BIBLIOGRAPHY.—*The Royal Gazette; Report of the Duncan Commission.* (J. C. HE.)

Nursery Schools: see EDUCATION: *Nursery Schools*.

Nutmegs: see SPICES.

Nuts. The Mediterranean basin almond crop for 1939 was estimated at 50,000 short tons (shelled), the smallest production since 1929 and comparable to 75,100 short tons (shelled) in 1938.

The United States (California) crop of almonds was 18,700 tons in 1939 and 15,000 tons in 1938, the ten-year average (1928-37) being 12,170 tons.

Table I. Almond (shelled) Production in Mediterranean Basin, 1938 and 1939

	1939 short tons	1938 short tons
Spain	23,000	24,000
Italy	15,000	44,000
Portugal	7,000	3,500
French Morocco	4,800	3,100
France	200	500

The largest nut crop in the United States, walnuts, was estimated Nov. 1, 1939, by the Department of Agriculture as 58,200 tons, of which 53,900 tons was in California and 4,300 tons in Oregon. The 1938 crop was 45,300 tons in California and 5,500 tons in Oregon. The Oregon yield of filberts was 3,120 tons in 1939 and 1,860 tons in 1938; in Washington 590 tons in 1939 and 380 tons in 1938. Pecans, the most widely grown commercial nut crop in the United States, produced in 1939 60,474,000lb., of which 22,281,000lb. were improved varieties and 38,193,000lb. wild or seedling.

The 1938 crop was 17,504,000lb. of improved varieties and 32,217,000lb. of wild or seedling varieties.

Table II. Pecan Production of 12 States in 1939

	Improved varieties lb.	Wild or seedling lb.		Improved varieties lb.	Wild or seedling lb.
Georgia	8,472,000	638,000	Texas	1,044,000	16,356,000
Mississippi	3,740,000	3,498,000	Oklahoma	769,000	10,220,000
Alabama	3,495,000	432,000	North Carolina	629,000	221,000
Louisiana	1,231,000	2,873,000	Arkansas	496,000	3,047,000
Florida	1,201,000	300,000	Missouri	34,000	526,000
South Carolina	1,188,000	132,000	Illinois	2,000	150,000

(See also PEANUTS.)

(S. O. R.)

Nyasaland: see BRITISH EAST AFRICA.

Nylon: see CHEMISTRY, APPLIED; COTTON: *Cotton Manufacture*; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY; RAYON; TEXTILE INDUSTRY.

Oats. As with all other food grains, the outbreak of war in Europe in Sept. 1939 caused an immediate rise in the price of oats. Average price received by United States farmers August 15 was 25.4 cents a bushel, but by September 15 the price had advanced to 31.5 cents. World production in 1939 for principal

Production of Oats in Certain Countries, 1938 and 1939

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
Germany	470,334,000*	468,549,000†	Hungary	24,495,000	21,382,000
France	375,986,000	375,986,000	Yugoslavia	23,881,000	22,496,000
Poland	198,415,000	183,015,000	Netherlands	22,873,000	30,765,000
Sweden	95,127,000	95,127,000	Northern		
England	74,060,000	74,830,000	Ireland	20,270,000	20,270,000
& Wales	74,060,000	74,830,000	Turkey	17,748,000	17,748,000
Denmark	57,572,000	57,572,000	Algeria	15,157,000	10,892,000
Finland	54,013,000	57,572,000	Norway	13,554,000	13,554,000
Scotland	44,340,000	44,340,000	Greece	10,586,000	10,586,000
Italy	40,430,000	43,342,000	Estonia	10,334,000	12,160,000
Belgium	42,738,000	42,738,000	Bulgaria	8,810,000	6,137,000
Ireland	39,133,000	39,133,000	French		
Rumania	37,892,000	31,904,000	Morocco	5,236,000	3,275,000
Spain†	32,511,000	21,977,000	Tunisia	2,067,000	2,067,000
Latvia	30,769,000	30,769,000	Luxemburg	3,100,000	2,864,000
Lithuania	27,657,000	28,936,000			

*Includes Austria and the Sudeten.

†Does not include Austria and the Sudeten.

‡Not included in totals.

countries was 2,357,482,000bu., compared to 2,486,364,000bu. in 1938 (estimate of the International Institute of Agriculture). Figures do not include U.S.S.R., for which a crop of 1,091,128,000 in 1938 is given by the Institute as an "approximate estimate." The latest figures from China are the average annual yield of 59,712,000bu. (1933-37). The 1939 oats crop in the United States was 941,230,000bu., compared to 1,053,839,000bu. in 1938 (Department of Agriculture preliminary estimate). Canada; 396,453,000bu. in 1939 and 394,593,000bu. in 1938. (See also CE-REALS.) (S. O. R.)

Obituaries. The following is a list of men and women who died during 1939. An asterisk (*) marks those for whom biographical notices are to be found in regular alphabetical position.

Name	Birth date	Death date
AALST, CORNELIS JOHANNES KAREL VAN, Dutch financier	May 7, 1866	Oct. 25
*ABBOTT, GRACE, U.S. social worker	Nov. 17, 1878	June 19
ABBOTT, JOHN, U.S. Indian leader and philanthropist	Oct. 1, 1879	July 25
*ABERDEEN, AND TEMAIR, ISHREI MARIA, DOWAGER	1857	Apr. 18
MARCHIONESS OF, British philanthropist and author	Mar. 7, 1874	June 8
ACLAND, SIR FRANCIS DYKE, British legislator	Dec. 22, 1862	Oct. 28
*ADAMS, JOHN TAYLOR, U.S. political leader	June 16, 1858	Mar. 30
ATKIN, PETER, U.S. engraver	May 4, 1884	Jan. 19
ALBERTI, MARIO, Italian economist	June 10, 1865	June 25
ALDOBRANDINI, GIUSEPPE, Italian prince and papal guard	Apr. 9, 1873	July 27
ALEXANDER, HARTLEY BURR, U.S. professor and author	1831(?)	July 21
ALEXANDER, PRINCE OF THURN AND TAXIS, Bohemian prince	Nov. 10, 1869	Nov. 22
ALEXANDER, WALLACE MCKINNEY, U.S. industrialist	May 9, 1889	Mar. 3
ALLEN OF HURWOOD, REGINALD CLIFFORD ALLEN, 1st Baron, British labour leader	1872	Sept. 17
ALMOND, REV. JOHN MACPHERSON, Canadian archdeacon	Nov. 20, 1859	Nov. 9
ALSCHULER, SAMUEL, U.S. judge	1867(?)	Nov. 16
ANDREW, HARRIET WHITE FISHER, U.S. manufacturer and author	Feb. 1, 1878	Aug. 13
ANDREWS, CHARLTON, U.S. educator and dramatist	July 8, 1857	Nov. 2
ANGELL, FRANK, U.S. psychologist	Jan. 13, 1860	Jan. 20
ANTHONY, REV. ALFRED WILLIAMS, U.S. theologian	June 17, 1847	Apr. 5
APPLETON, FRANCIS HENRY, U.S. agriculturist	Dec. 25, 1863	June 10(?)
*ARMSTRONG, ALEXANDER, U.S. attorney and State official	June 28, 1877	Nov. 20
*AROSEMENA, JUAN DEMOSTENES, Panamanian statesman	1879	Dec. 15
ARPS, GEORGE FREDERICK, U.S. educator	Jan. 23, 1874	Sept. 16
BABBITT, EDWIN BURR, U.S. major general	July 26, 1862	Dec. 9
*BACKHOUSE, SIR ROGER ROLAND CHARLES, British admiral	Nov. 24, 1808	July 15
BAKER, OLIVER, British artist and author	Mar. 30, 1856	Apr. 11
*BAKER, THOMAS STOCKHAM, U.S. educator	Mar. 23, 1871	Apr. 7
BALDWIN, ARTHUR J., U.S. attorney and philanthropist	Aug. 26, 1868	July 21
BALFOUR, HENRY, British anthropologist and archaeologist	1863	Feb. 9
*BARODA, MAHARAJA GAEKWAR SIR SAYAJI RAO III, Indian prince	Mar. 10, 1863	Feb. 6
BARRA, FRANCISCO LEON DE LA, Mexican statesman	June 10, 1863	Sept. 23
BARRON, OSWALD, British authority on heraldry	Jan. 3, 1868	Sept. 24
BARTI, CARL GEORGE LANGE, U.S. geologist	Feb. 28, 1860	Oct. 28
*BARTON, DONALD CLINTON, U.S. engineer	June 29, 1880	July 8
*BARZILLAI, SALVATORE, Italian senator	July 5, 1860	May 8
BATES, ANNA, U.S. actress	Nov. 10, 1869	Nov. 1
*BATES, ERNEST SUTHERLAND, U.S. historian and critic	Oct. 14, 1879	Dec. 4
BAUM, DWIGHT JAMES, U.S. architect	June 24, 1886	Dec. 13
BEATY, AMOS LEONIDAS, U.S. oil executive	Sept. 1, 1870	Apr. 29
BEAUBIEN, LOUIS DE GASPE, Canadian financier	Oct. 29, 1867	Nov. 13
BEGGS, GEORGE ERLE, U.S. educator and engineer	Apr. 13, 1883	Nov. 23
BENARES, MAHARAJA OF (SIR ADITYA NARAYAN SINGH BADAHUR), Indian prince	Nov. 17, 1874	Apr. 5
BENENSON, GRIGORI, U.S. financier	Mar. 1, 1860	Apr. 5
BENNETT, LAURA, U.S. actress	Sept. 28, 1850	Sept. 24
*BENSON, SIR FRANK ROBERT, British actor	Nov. 4, 1858	Dec. 31
BERMANN, RICHARD A., Austrian author and journalist	Apr. 27, 1883	Sept. 5
BERNARD, OLIVER PERCY, British stage designer	Apr. 8, 1881	Apr. 15
*BERNSTORFF, JOHANN HEINRICH, Count Von, German diplomat	Nov. 14, 1862	Oct. 6
BINGHAM, (EDWARD) BARRY (STEWART), British admiral	July 26, 1881	Sept. 24
BIRCH, SIR JAMES FREDERICK NOEL, British general	Dec. 29, 1865	Feb. 3
BITJA, ALFRED, Polish governor of Lwow	1889(?)	Sept. 19
BITTNER, JULIUS, Austrian composer	Apr. 8, 1874	Jan. 9
BLASCHKA, RUDOLPH, German creator of glass flowers in Harvard museum	1856(?)	May 1
*BLEDISOE, SAMUEL THOMAS, U.S. railroad executive	May 12, 1868	Mar. 8
BODANZKY, ARTHUR, U.S. opera conductor	Dec. 16, 1877	Nov. 23
BOEWONE, PAKOE, SULTAN OF SURAKARTA, Javanese ruler	1865(?)	Feb. 20
BOLLES, ALBERT SIDNEY, U.S. educator and author	Mar. 8, 1846	May 8
BOLTON, CHESTER CASTLE, U.S. Congressman	Sept. 5, 1882	Oct. 29
BONVIN, REV. LUDWIG, U.S. composer	Feb. 17, 1850	Feb. 18
BOOTH, CHRISTOPHER HENRY HUDSON, U.S. musician	Sept. 5, 1865	Apr. 19
BOUCHER, JACQUES, French sculptor	1870	June 18
BOUSQUET, PAUL HENRI JACQUES, French author	Jan. 24, 1883	Nov. 18
BRADLEY, WILLIAM ASPENWALL, U.S. author and critic	Feb. 8, 1878	Jan. 9
*BRADY, ALICE, U.S. actress	Nov. 2, 1892	Oct. 28
BRAININ, REUBEN, U.S. author and Hebrew leader	Mar. 15, 1862	Nov. 30
BRAUN, JOHN FREDERICK, U.S. manufacturer	June 22, 1867	Nov. 18
BRESEE, BURTIS BURR, U.S. psychologist	May 17, 1867	July 31
*BREGUET, JACQUES EUGENE, French aircraft designer	Apr. 23, 1881	Mar. 21
BREWSTER, DR. GEORGE EMERSON, U.S. surgeon and educator	July 28, 1861	Dec. 24
BREWSTER, EUGENE VALENTINE, U.S. publisher and author	Sept. 7, 1871	Jan. 1
*BRIDGE, JAMES HOWARD, U.S. author	May 8, 1864	May 28
BRIDGES, DR. MILTON ARLANDEN, U.S. medical educator	May 20, 1862	Aug. 19
*BRISTOL, MARK LAMBERT, U.S. admiral	Apr. 17, 1868	May 13
BRITTL, JAMES J., U.S. Congressman	Mar. 4, 1861	Dec. 26
BRITTON, WILTON EVERETT, U.S. entomologist	Sept. 18, 1868	Feb. 15

Name	Birth date	Death date
BRODIE, EDWARD EVERETT, U.S. editor and diplomat	Mar. 12, 1876	June 27
BRODIE, DR. MAURICE, Canadian immunologist	Aug. 19, 1903	May 9
BROOKE, REV. ALAN ENGLAND, British chaplain to the King	Sept. 1, 1863	Oct. 30
*BROWN, HEYWOOD (CAMPELL), U.S. author and journalist	Dec. 7, 1838	Dec. 18
BROWN, BILL, Canadian pioneer	Dec. 26, 1839	Jan. 19
BROWN, SIR GEORGE McLAREN, Canadian railroad executive	Jan. 29, 1865	June 28
BROWN, JAMES, British labour leader	Dec. 16, 1862	Mar. 21
BROWN, JAMES STANLEY, U.S. educator	Sept. 13, 1863	Sept. 6
BROWN, OSWALD EUGENE, U.S. educator	Dec. 8, 1861	Oct. 22
BROWN, REV. WALLACE ELIAS, U.S. Methodist bishop	Oct. 30, 1868	Nov. 18
BROWN, WILLIAM HENRY, U.S. botanist	Oct. 6, 1884	Nov. 9
BROWNING, JONATHAN EDMUND, U.S. co-inventor of rifle	Jan. 26, 1859	May 16
*BRUBACHER, ABRAHAM ROYER, U.S. educator	July 27, 1870	Aug. 23
*BRUCE, CHARLES GRANVILLE, British explorer	Apr. 7, 1866	July 12
*BRUCHESI, REV. LOUIS JOSEPH PAUL NAPOLEON, Canadian archbishop	Oct. 29, 1855	Sept. 20
BRUSTLE, GEORGE MATTHEW, U.S. painter	Dec. 21, 1871	Aug. 14
BRUMMITT, REV. DAN BREARLY, U.S. editor	Aug. 13, 1867	Apr. 5
BRYANT, RALPH CLEMENT, U.S. forester	Jan. 22, 1877	Feb. 1
BUCHANAN, A. W. PATRICK, Canadian attorney and author	1870	Oct. 31
BUCKLEY, DR. ALBERT COULSON, U.S. neuropsychiatrist	Aug. 6, 1873	Aug. 17
BURD, REV. WALTER, Canadian bishop	Feb. 23, 1888	Aug. 2
BURNETT, CHARLES, U.S. brigadier general and chief of insular affairs	Oct. 28, 1877	Nov. 28
BURNHAM, JOHN BIRD, U.S. author and conservationist	Mar. 16, 1869	Sept. 24
BURR, GEORGE ELBERT, U.S. artist	Apr. 15, 1859	Nov. 17
BURT, EDWARD ANGUS, U.S. botanist	Apr. 9, 1859	Apr. 27
*BUSCH, GERMAN, Bolivian statesman and soldier	Mar. 23, 1904	Aug. 23
*BUTLER, PIERCE, associate justice of U.S. Supreme Court	Mar. 17, 1866	Nov. 10
BUTTENWIESER, MOSES, U.S. Biblical scholar	Apr. 5, 1862	Mar. 12
*CABOT, DR. RICHARD CLARKE, U.S. physician	May 21, 1868	May 8
CADY, REV. GEORGE LUTHER, U.S. missionary leader	June 3, 1868	Nov. 23
*CALINESCU, ARMAND, Rumanian statesman	May 22, 1893	Sept. 21
CAMMACK, IRA INSCO, U.S. educator	Feb. 16, 1868	Sept. 11
CANNON, LAWRENCE ARTHUR DUMOULIN, Canadian jurist	Apr. 28, 1877	Dec. 25
CARRIGAN, WILLIAM L., U.S. artist	Sept. 21, 1868	Oct. 27
CARROLL, BERYL F., U.S. State governor	Mar. 15, 1860	Dec. 16
*CARTER, HOWARD, British Egyptologist	1873	Mar. 2
*CEDILLO, SATURNINO, Mexican rebel general	(?)	Jan. 11
*CESPEDES Y QUESADA, CARLOS MANUEL DE, Cuban statesman	Aug. 12, 1871	Mar. 28
CHAMBERLAYNE, CHURCHILL GIBSON, U.S. educator	Dec. 23, 1876	Apr. 3
CHAMBERS, FRANK MONMOUTH, U.S. illustrator	Dec. 10, 1865	June 11
*CHANDLER, CHARLES DE FOREST, U.S. aeronautics expert	Dec. 24, 1868	May 18
CHAPMAN, FRANCIS, U.S. legal educator	Aug. 19, 1869	May 2
CHAPPELLE, LOUIS DE, French statesman	June 21, 1876	Dec. 9
CHILTON, WILLIAM EDWIN, U.S. Senator	Mar. 17, 1858	Nov. 7
*CIANO, COSTANZO, Italian statesman	Aug. 30, 1876	June 26
CLERGEUE, FRANCIS HECTOR, Canadian-American industrialist	May 28, 1856	Jan. 19
CLINTON-BAKER, SIR LEWIS, British admiral	Mar. 16, 1866	Dec. 12
COAR, JOHN FIRMAN, U.S. scholar	July 26, 1863	June 26
COLCORD, ROSWELL KEYES, U.S. State governor	Apr. 25, 1839	Oct. 30
COLE, CYRENUS, U.S. legislator	Jan. 13, 1863	Nov. 14
COLE, GEORGE WATSON, U.S. librarian and bibliographer	Sept. 6, 1850	Oct. 10
COLEBROOKE, EDWARD ARTHUR COLEBROOKE, 1st Baron, British court official	Oct. 12, 1861	Feb. 28
COLEMAN, ALGERNON, U.S. educator and editor	Aug. 9, 1876	Aug. 8
COLEMAN, EDWARD DAVIDSON, U.S. librarian	Aug. 15, 1891	Sept. 3
COLERUS, EGMONT, Austrian novelist	1887	Apr. 11
*COLLIER, BARRON, U.S. advertising executive	Mar. 23, 1873	Mar. 13
COLLIN, FREDERICK, U.S. jurist	Aug. 2, 1850	Nov. 26
*COLVILLE, SIR STANLEY (CECIL JAMES), British admiral	Feb. 21, 1861	Apr. 9
COMAN, WILBER EDMUND, U.S. railroad official	May 15, 1869	June 10
*COMISKEY, JOHN LOUIS, U.S. baseball executive	Aug. 12, 1885	July 18
CONROY, REV. JOSEPH H., U.S. Catholic bishop	Nov. 8, 1858	Mar. 20
CORCORAN, REV. FRANCIS VINCENT, U.S. educator	May 6, 1879	Jan. 28
CORREYON, HENRI, Swiss botanist	1854(?)	May 11
*COSTIGAN, EDWARD PRENTISS, U.S. Senator	July 1, 1874	Jan. 17
COUTAN, JULES-FELIX, French sculptor	1848	Feb. 23
*COWLES, HENRY CHANDLER, U.S. botanist	Feb. 27, 1869	Sept. 12
CRANDON, DR. LE ROI GODDARD, U.S. surgeon	Jan. 15, 1873	Dec. 27
*CRANE, CHARLES RICHARD, U.S. diplomat	Aug. 7, 1858	Feb. 15
CRAVENS, BEN, U.S. congressman	Jan. 17, 1874	Jan. 13
CRAWFORD, JAMES PYLE WICKERSHAM, U.S. professor	Feb. 19, 1882	Sept. 22
CRIM, GIULIO, Italian tenor	May 10, 1885	Oct. 29
*CRISTEA, MIKON, Rumanian patriarch and statesman	July 20, 1868	Mar. 6
CRITZ, HUGH, U.S. educator	Dec. 21, 1876	Jan. 28
CROMMELIN, ANDREW CLAUDE DE LA CHEROIS, British astronomer	Feb. 6, 1865	Sept. 20
CRONAU, RUDOLF, U.S. artist and author	Jan. 21, 1855	Oct. 27
*CROSLY, WALTER SELWYN, U.S. rear admiral	Oct. 30, 1871	Jan. 6
CROSS, REV. EDWARD WEEKS, U.S. clergyman	Feb. 12, 1885	Nov. 2
CUNNINGHAM, LOUIS WYBORN, U.S. jurist	Aug. 14, 1863	Apr. 21
*CUSHING, DR. HARVEY, U.S. brain surgeon	Apr. 8, 1869	Oct. 7
DALTON, HENRY GEORGE, U.S. industrialist	Oct. 3, 1862	Dec. 27
*DARANYI, KOMAN, Hungarian statesman	Mar. 27, 1886	Nov. 1
DASHIELL, WILLIAM ROBERT, U.S. brigadier-general	Apr. 3, 1863	Mar. 16
DAVIDSON, ISRAEL, U.S. Hebrew scholar	May 27, 1870	June 27
DAVIES, ELLIS WILLIAM, British M.P.	Apr. 12, 1871	Apr. 29
*DAVIES, JOHN VIFOND, U.S. civil engineer	Oct. 13, 1862	Oct. 4
DAVIS, IRVING G., U.S. economist	Apr. 25, 1885	Mar. 15
DAVIS, NELSON FITHIAN, U.S. professor	Aug. 10, 1872	Nov. 11
DAVIS, WARREN BLAIR, U.S. editor and publisher	Sept. 12, 1877	Sept. 1
*DAWSON-WATSON, DAWSON, U.S. painter	July 21, 1864	Sept. 3
DAY, HARRY, British M.P.	Sept. 16, 1880	Sept. 15
DEAN, ALEXANDER, U.S. professor and dramatic director	May 6, 1893	July 29
DEETJEN, OTTO PAUL WERNER, German librarian	Apr. 3, 1877	May 22
DEIBLER, ANATOLE ("MONSIEUR DE PARIS"), French executioner	1863(?)	Feb. 2
DELL, ETHEL M., British novelist	(?)	Sept. 17
DENBIGH, RUDOLPH ROBERT BASIL ALOYSIUS AUGUSTINE	May 26, 1859	Nov. 25
FEILDING, OTH EARL, British Catholic leader	July 19, 1864	Jan. 14
DE SALIS, JOHN FRANCIS CHARLES, Count de Salis, British diplomat	July 19, 1864	Jan. 14
*DETERDING, SIR HENRI WILHELM AUGUST, Dutch oil executive	Apr. 19, 1866	Feb. 4
DEULL, HARVEY V., U.S. newspaper editor	Nov. 20, 1890	Oct. 29
DE VRIES, MARION, U.S. jurist	Aug. 15, 1865	Sept. 11

Name	Birth date	Death date
DICKINSON, OLIVER BOOTH, U.S. jurist	Sept. 25, 1857	Sept. 16
DIETEL, WILLIAM F., U.S. manufacturer	Jan. 19, 1877	Oct. 10
*DMOWSKI, ROMAN, Polish statesman	Aug. 9, 1864	Jan. 2
*DOHERTY, HENRY L., U.S. industrialist and philanthropist	May 15, 1870	Dec. 26
*DOLAN, REV. FRANCIS JAMES, U.S. educator	July 14, 1893	Sept. 6
*DOLCI, ANGELO MARIA, Italian cardinal	July 12, 1867	Sept. 14
*DONNELLY, CHARLES, U.S. railroad executive	Nov. 9, 1860	Sept. 4
DOPPER, CORNELIS, Dutch composer	Feb. 2, 1870	Sept. 18
DOUGLASS, BENJAMIN WALLACE, U.S. entomologist and fruit grower	Feb. 17, 1882	Dec. 6
DUFFY, JACK, U.S. comedian	Sept. 4, 1882	July 23
DUMONT, FREDERICK THEODORE FRELINGHUYSEN, U.S. foreign service officer	Mar. 17, 1869	June 4
DUNBAR, CHARLES AUGUSTUS ROYER FLOOD, British admiral	June 30, 1849	May 9
DUNN, CHARLES JOHN, U.S. jurist	July 14, 1872	Nov. 10
DUNN, HERBERT OMAR, U.S. rear admiral	May 29, 1857	Feb. 13
DURKEE, FRANK WILLIAMS, U.S. chemist and educator	Oct. 5, 1861	May 21
*DUVEEN, BARON (JOSEPH DUVEEN), British art dealer	Oct. 14, 1869	May 25
*DYSON, SIR FRANK (WATSON), British astronomer	Jan. 8, 1868	May 25
*EARLE, RALPH, U.S. rear admiral and educator	May 3, 1874	Feb. 13
*EASLEY, RALPH MONTGOMERY, U.S. political economist	Feb. 25, 1856	Sept. 7
EATON, THOMAS M., U.S. Congressman	Aug. 3, 1896	Sept. 16
EBERHARDT, MAGNUS F. W. von, German general	Dec. 6, 1855	Jan. 25
EDDY, DR. FORREST GREENWOOD, U.S. dentist	Sept. 8, 1853	May 17
EDDY, SPENCER, U.S. diplomat	June 18, 1874	Oct. 7
EDGAR, DR. JAMES CLYTON, U.S. obstetrician	June 14, 1859	Apr. 7
EDGREN, ROBERT WADSWORTH, U.S. cartoonist	Jan. 27, 1874	Sept. 9
EDMONDS, GEORGE WASHINGTON, U.S. Congressman	Feb. 22, 1864	Sept. 28
EGBERT, DR. SENECA, U.S. medical educator	Feb. 17, 1863	Dec. 6
ELLIOTT, DR. CHARLES ADDISON, U.S. physician	Mar. 6, 1873	June 26
*ELLIS, (HENRY) HAVELOCK, British psychologist and author	Feb. 2, 1859	July 8
EMBOLDY, GEORGE CHARLES, U.S. biologist	Nov. 23, 1876	Feb. 17
ENGELBRECHT, HELMUTH C., U.S. author	Jan. 15, 1895	Oct. 8
ENNA, AUGUST, Danish composer	1859	Aug. 3
EVANS, REV. MILTON G., U.S. educator	Dec. 7, 1862	Sept. 17
EVERWIJN, JAN CHARLES AUGUST, Dutch statesman	Nov. 15, 1873	Jan. 5
*FAIRBANKS, DOUGLAS ELTON, Sr., U.S. motion picture actor	May 23, 1883	Dec. 12
FAIRBANKS, FRANK PERLEY, U.S. muralist	July 17, 1875	Aug. 8
*FARRAND, DR. LIVINGSTONE, U.S. educator	June 14, 1867	Nov. 8
*FAWCETT, GEORGE D., U.S. actor	Aug. 25, 1860	June 6
*FEARN, DR. ANNE WALTER, U.S. physician and author	1867(?)	Apr. 28
*FECHNER, ROBERT, U.S. director of Civilian Conservation Corps	Mar. 22, 1876	Dec. 31
FIEDLER, MAX, German orchestra conductor	Dec. 31, 1859	Dec. 2
FIFE, GEORGE HUCHANAN, U.S. journalist and author	Aug. 9, 1869	Mar. 12
*FINCK, HERMAN, British composer	Nov. 4, 1872	Apr. 21
FISH, WILLISTON, U.S. lawyer and author	Jan. 15, 1858	Dec. 19
*FISHER, CARL G., U.S. real estate executive	Jan. 12, 1874	July 15
FISK, PLYN, U.S. financier	Aug. 26, 1860	Mar. 30
*FITZGERALD, FRANK DWIGHT, U.S. governor	Jan. 27, 1885	Mar. 16
FLIPPIN, DR. JAMES CARROLL, U.S. medical educator	Jan. 26, 1878	Feb. 16
*FOKKER, ANTHONY HERMAN GERARD, Dutch aeroplane designer	Apr. 6, 1890	Dec. 23
*FORD, FORD MADDOX, British author	1873	June 26
FORD, WILLIAM EBENEZER, U.S. mineralogist	Feb. 18, 1878	Mar. 23
FORRESTER, JAMES JOSEPH, U.S. statistician	Oct. 28, 1867	May 1
FOWLER, SIR JOHN SHARMAN, British general	July 27, 1864	Sept. 20
FOX, CHARLES J., U.S. publisher	July 23, 1873	Oct. 25
FRANCE, DR. JOSEPH IRWIN, U.S. Senator	Oct. 11, 1873	Jan. 26
FRANK, TENNEY, U.S. Latin scholar	May 19, 1876	Apr. 3
FRANKLIN, FABIAN, U.S. author and educator	Jan. 18, 1853	Jan. 9
*FRANKLIN, PHILIP ALBRIGHT SMALL, U.S. shipping executive	Feb. 1, 1871	Aug. 14
FREAR, JAMES A., U.S. legislator	Oct. 24, 1861	May 18
FREE, EDWARD ELWAY, U.S. chemist and editor	May 3, 1883	Nov. 24
*FREUD, SIGMUND, Austrian psychoanalyst	May 6, 1856	Sept. 23
FREY, OLIVER W., U.S. legislator	Sept. 7, 1890	Aug. 26
FRIEDLANDER, DR. ALFRED, U.S. medical educator	July 5, 1871	May 28
FRIESEKE, FREDERICK CARL, U.S. painter	Apr. 7, 1874	Aug. 27
*FRITSCH, WERNER VON, German general	Aug. 4, 1880	Sept. 22
FULDA, LUDWIG, German playwright	July 15, 1862	Mar. 30
FULTON, JOHN ALLEN, U.S. mining engineer	Sept. 24, 1878	Oct. 9
GAMBOA, FEDERICO, Mexican novelist and statesman	1864	Aug. 15
GARDNER, HENRY BRAYTON, U.S. economist and educator	Mar. 26, 1863	Apr. 22
GARST, PERRY, U.S. rear admiral	July 11, 1848	Aug. 29
*GASTER, MOSES, British-Rumanian Hebrew scholar	1856	Mar. 5
*GATES, REV. MILO HUDSON, U.S. clergyman	June 29, 1866	Nov. 27
*GAY, DR. FREDERICK PARKER, U.S. pathologist	July 22, 1874	July 14
GEIGER, FERDINAND A., U.S. judge	Oct. 15, 1867	July 31
*GHAZI IBN FEISAL, King of Iraq	Mar. 21, 1912	Apr. 4
GHERARDI, WALTER ROCKWELL, U.S. rear admiral	Aug. 9, 1875	July 24
GHUZNAVI, SIR ABDELKERIM, Indian political leader	Aug. 25, 1872	July 24
*GIBBONS, FLOYD (PHILLIPS), U.S. war correspondent	July 10, 1887	Sept. 24
GIBNEY, AGNES, British writer	1845	Aug. 21
GILBERT, HIRAM THORNTON, U.S. jurist	May 9, 1850	Nov. 29
GILBERT, NEWTON WHITING, U.S. jurist	May 24, 1862	July 5
*GILBERT, PRENTISS BAILEY, U.S. diplomat	Oct. 3, 1883	Feb. 24
GILBERT, RALPH, U.S. legislator	Jan. 17, 1882	July 30
GILCHRIST, DONALD BEAN, U.S. librarian	Jan. 11, 1892	Aug. 4
GILLESPIE, JULIAN EDGEWORTH, U.S. commercial attaché	June 20, 1893	June 23
GILLET, SIR GEORGE, British legislator	1870	Aug. 10
GILLINGWATER, CLAUDE, U.S. actor	Aug. 2, 1870	Nov. 1
*GILMAN, LAWRENCE, U.S. critic and author	July 5, 1878	Sept. 9
GIMBEL, DANIEL, U.S. merchant	Dec. 1863	Sept. 8
GLADWIN, MARY ELIZABETH, U.S. nurse and educator	Dec. 24, 1861	Nov. 22
GODFREY, SIR DAN, British conductor	June 20, 1868	July 20
GOETZE, SIGISMUND CHRISTIAN HUBERT, British artist	Oct. 24, 1866	Oct. 24
Goff, Sir PARK, British legislator	Feb. 12, 1871	Apr. 15
*GOODNOW, FRANK JOHNSON, U.S. educator	Jan. 18, 1859	Nov. 14
GOODWIN, REV. WILLIAM ARCHER RUTHERFORD, U.S. clergyman and educator	June 18, 1869	Sept. 7
*GORDON, SIR CHARLES BLAIR, Canadian financier	Nov. 22, 1867	July 30
GOYAU, GEORGES, French author and sec'y of French Academy	May 31, 1869	Oct. 25
GRANDGENT, CHARLES HALL, U.S. professor	Nov. 14, 1862	Sept. 11
*GRANGER, ALFRED HOYT, U.S. architect	May 31, 1867	Dec. 3
GRANTVILLE, GRANTVILLE GEORGE LEVISON-GOWER, 3RD EARL, British diplomat	Mar. 4, 1872	July 21
GRAVES, RALPH HENRY, U.S. editor	July 11, 1878	Dec. 1

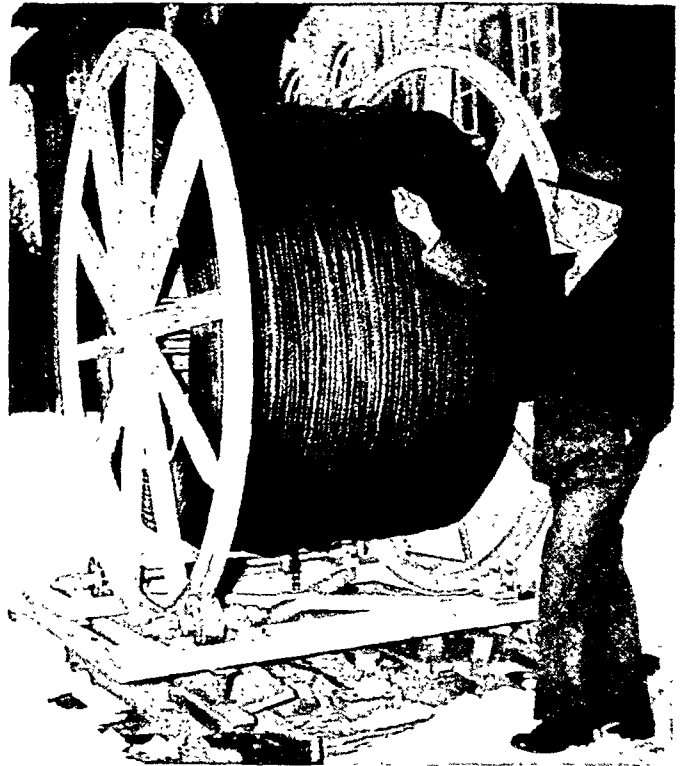
Name	Birth date	Death date
*GRAY, CARL RAYMOND, U.S. railroad executive	Sept. 28, 1867	May 9
GRAYSON, DR. CHARLES PREVOST, U.S. laryngologist	Oct. 15, 1850	Aug. 10
GREEN, HENRY WOODHULL, U.S. lawyer	Apr. 30, 1868	Nov. 24
GREENE, FREDERICK STUART, U.S. civil engineer	Apr. 14, 1870	Mar. 26
*GREY, ZANE, U.S. author	Jan. 31, 1875	Oct. 23
*GRINNELL, JOSEPH, U.S. zoologist	Feb. 27, 1877	May 29
GRISWOLD, HARRY W., U.S. congressman	May 10, 1886	July 4
*GROENER, WILHELM, German general	Nov. 22, 1867	May 4
GROSZ, WILHELM, Austrian composer	Aug. 11, 1894	Dec. 9
GURKIN, IVAN, Russian scientist	1870(?)	Apr. 21
*GUGGENHEIM, MURRY, U.S. financier and philanthropist	Aug. 12, 1858	Nov. 15
GULICK, JOHN W., U.S. major-general	Nov. 8, 1874	Aug. 18
GUTHRIE, HUGH, Canadian statesman	Aug. 13, 1866	Nov. 3
*HAAB, ROBERT, Swiss statesman	Aug. 8, 1865	Oct. 15
HALLE, RT. REV. JOSEPH, Canadian Catholic prelate	Dec. 10, 1874	Oct. 7
*HALLIBURTON, RICHARD, U.S. author	Jan. 9, 1900	Mar. 23(?)
HALLLOWELL, ROBERT, U.S. artist and publisher	Mar. 12, 1886	Jan. 26
HAMILTON, LORD ERNEST (WILLIAM), British author	Feb. 5, 1858	Dec. 14
HAMILTON, H. ADELBERT, U.S. philologist	Jan. 14, 1870	May 23
HAMLIN, SIMON MOULTON, U.S. legislator	Aug. 10, 1866	July 27
HAMMOND, SIR EGBERT LAURIE LUCAS, British colonial administrator	Jan. 12, 1873	Jan. 28
HANDMAN, MAX SYLVYUS, U.S. economist	Dec. 13, 1885	Dec. 26
HANKIN, DR. ERNEST HANBURY, British bacteriologist	Feb. 4, 1865	Mar. 29
HARDING, GEORGE FRANKLIN, U.S. politician	Aug. 10, 1868	Apr. 2
HARKAVY, ALEXANDER, U.S. lexicographer and author	May 5, 1863	Nov. 27
HARKER, ALFRED, British petrologist	Feb. 10, 1859	July 29
HARREL, SIR DAVID, representative of British crown in Ireland	Mar. 25, 1841	May 12
HARRIS, DR. LOUIS ISRAEL, U.S. public health authority	Jan. 27, 1882	Jan. 6
HART, LOUIS BRETT, U.S. judge	Mar. 30, 1869	July 18
HATTON, FANNY COTTINET LOCKE, U.S. playwright and critic	Mar. 6, 1860	Nov. 27
HAYASHI, GONSUKE, Japanese statesman	Mar. 1860	Jan. 27
*HEATH, LADY MARY (MRS. G. A. R. WILLIAMS), British aviatrix	1895(?)	May 9
*HELLER, EDMUND, U.S. naturalist	May 21, 1875	July 18
HELMLE, FRANK J., U.S. architect	Mar. 5, 1869	July 15
HENRI, DUKE OF BOURBON-PARMA	June 13, 1873	May 10
HERBERT, SIR SIDNEY, British baronet and M.P.	July 29, 1890	Mar. 22
HIGGINS, REV. JOSEPH REGINALD, U.S. priest	Feb. 21, 1862	Nov. 28
HILL, ARTHUR EDWARD, U.S. chemist and educator	Mar. 20, 1880	Mar. 16
HIN WONG, Chinese journalist	Oct. 5, 1887	Feb. 15
HIRSCHFELD, CLARENCE FLOYD, U.S. scientist and author	Jan. 30, 1881	Apr. 10
HOBAN, WALTER CEPHAS, U.S. cartoonist	Aug. 11, 1890	Nov. 22
HOEHNZOLLERN, OSKAR WILHELM KARL HANS KUNO VON, Prussian prince	July 12, 1915	Sept. 14(?)
HOLMAN, LOUIS ARTHUR, U.S. antiquarian and author	July 13, 1866	Dec. 14
HOPKINS, ARTHUR JOHN, U.S. professor	Sept. 20, 1864	Nov. 10
HOPKINSON, SIR ALFRED, British educator	June 28, 1851	Nov. 12
HOUTART, BARON MAURICE JULES, Belgian statesman	July 5, 1866	Feb. 1
*HOWARD, SIDNEY COE, U.S. dramatist	June 26, 1891	Aug. 23
*HOWARD OF PENRITH, ESMIE WILLIAM HOWARD, 1st Baron, British diplomat	Sept. 15, 1863	Aug. 1
*HSU SHIH-CHIANG, Chinese statesman	1858	June 5
HULBERT, MARY ALLEN, U.S. author	Nov. 26, 1863	Dec. 17
HULL, WILLIAM ISAAC, U.S. historian and educator	May 10, 1868	Nov. 14
HUMPHREY, ARTHUR LUTHER, U.S. industrialist	June 12, 1860	Nov. 1
IGLESIAS, SANTIAGO, Puerto Rican territorial delegate	Feb. 22, 1872	Dec. 5
IVES, JOSEPH MOSS, U.S. jurist and author	Feb. 5, 1876	Apr. 7
IWANAGA, YUKICHI, Japanese journalist	Sept. 1883	Sept. 2
JACKSON, DR. REGINALD HENRY, U.S. surgeon	Jan. 17, 1876	Sept. 7
JANVIER, MARIE-ALBERT, French clergyman	1860	Apr. 28
*JASPAR, HENRI, Belgian statesman	July 23, 1870	Feb. 15
JOHANIS, VACLAV, Czech statesman	1871(?)	June 18
JOHNSON, FRANK TENNEY, U.S. artist	June 26, 1874	Jan. 1
*JOHNSON, ROYAL CLEAVES, U.S. Congressman	Oct. 3, 1882	Aug. 2
JONES, JOHN ARTHUR, Indian journalist	1867	June 16
JONES, MORGAN, British M.P.	May 3, 1885	Apr. 23
JUCH, EMMA ANTONIA JOANNA, U.S. singer	July 4, 1860	Mar. 6
*KALICH, BERTHA, Polish-American actress	1874(?)	Apr. 18
KAVANAUGH, WILLIAM HARRISON, U.S. engineering educator	Aug. 10, 1873	May 6
KEITH, CHARLES PENROSE, U.S. attorney and historian	Mar. 15, 1854	Apr. 23
KELLY, FLORENCE FINCH, U.S. author	Mar. 27, 1858	Dec. 17
*KELLY, WALTER C., U.S. actor	Oct. 29, 1873	Jan. 6
KENNEDY, FRANCIS WILLIAM, British admiral	1862	July 11
*KENNELLY, ARTHUR EDWIN, U.S. electrical engineer	Dec. 17, 1861	June 18
KENNEY, WILLIAM PATRICK, U.S. railroad executive	Jan. 10, 1870	Jan. 24
KERR, JOHN BROWN, U.S. railroad executive	Feb. 1, 1851	June 25
KEYS, DAVID REID, Canadian historian	May 2, 1856	July 11
KIDDER, KATHRYN, U.S. actress	Dec. 23, 1860	Sept. 7
KING, DR. CORA SMITH, U.S. physiotherapist and suffragist	Sept. 7, 1867	Nov. 21
KING, FREDERICK ALLEN, U.S. author and editor	Feb. 20, 1865	Oct. 31
KING-HALL, SIR GEORGE FOWLER, British admiral	Aug. 14, 1850	Sept. 10
KIPLING, CAROLINE BALESTIER, widow of Rudyard Kipling	Dec. 31, 1865	Dec. 10
KIRBY, REV. J. EDWARD, U.S. minister and educator	Dec. 23, 1873	Nov. 13
KIRKLAND, JAMES HAMPTON, U.S. educator	Sept. 9, 1855	Oct. (?)
KLOFAC, VACLAV, Czech political leader	1868	Oct. (?)
KNOCHENHAUTER, WILHELM, German general	Jan. 16, 1878	June 28
KORFANTY, WOJCIECH, Polish political leader and journalist	1873	Aug. 16
KRAUSE, LYNDA FARRINGTON ("BARBARA YECHTON"), U.S. author and editor	(?)	Oct. 31
KRAUT, JULIUS, German portrait painter	June 17, 1859	July 2
*KRUPSKAYA, NADEZHDA KONSTANTINOVNA, Russian educator and widow of Lenin	Feb. 26, 1860	Feb. 27
KUN, LADISLAS, Hungarian-American composer	Aug. 12, 1860	May 2
KUNDT, HANS ANTON WILHELM FRIEDRICH, German commander of Bolivian forces in Chaco war	Feb. 28, 1860	Aug. 28
KUSHIDA, MAMO, Japanese financier	Feb. 10, 1867	Sept. 6
LACOUR, LEOPOLD, French dramatist	1854	Apr. 29
LADD, ANNA COLEMAN, U.S. author and sculptor	July 15, 1878	June 3
*LAEMMLE, CARL, Sr., U.S. motion picture executive	Jan. 17, 1867	Sept. 24
*LAMBERT, DR. ALEXANDER, U.S. physician and narcotics specialist	Dec. 15, 1861	May 9
LANE, MERRITT, U.S. jurist	Jan. 2, 1881	Dec. 23
*LANGSDORFF, HANS, German naval officer	Mar. 20, 1894	Dec. 20
LATIMER, JULIAN LANE, U.S. admiral	Oct. 10, 1863	June 4
LAUBEUF, MAX, French submarine designer	1864(?)	Dec. 23

Name	Birth date	Death date
*LAVELLE, REV. MICHAEL J., U.S. clergyman	May 30, 1856	Oct. 17
LAWRENCE, SR. ALEXANDER, British solicitor to Treasury	May 18, 1874	Sept. 3
LAWRENCE, GEORGE WARREN, U.S. public utilities executive	Sept. 14, 1875	May 28
LAY, JULIUS GARECHE, member of U.S. Foreign Service	Aug. 9, 1872	Aug. 28
LE BOEUF, RANDALL JAMES, U.S. jurist	Mar. 10, 1870	Sept. 14
*LEDEKER, EMIL, German economist	Aug. 22, 1882	May 29
LEE, DR. FREDERIC SCHILLER, U.S. physiologist	June 16, 1859	Dec. 14
LEE, JOHN YITUBONG, Chinese scientist and educator	1884	Apr. 20
LEE, PORTER RAYMOND, U.S. social worker	Dec. 21, 1879	Mar. 8
LEGGETT, EUGENE SHELDON, U.S. journalist and Gov't official	Dec. 9, 1902	Feb. 19
LEQUEUR, DR. FELIX, French surgeon	Mar. 12, 1863	Oct. 4
LESLIE, AMY (MRS. LILLIE WEST BROWN-BUCK), U.S. dramatic critic	Oct. 11, 1860	July 3
LEVETZOFF, MAGNUS VON, German admiral	Jan. 8, 1871	Mar. 13
LEVY, GERSON BARUCH, U.S. rabbi and editor	Jan. 23, 1878	Feb. 14
*LEWIS, JAMES HAMILTON, U.S. Senator	May 18, 1866(?)	Apr. 9
LEWIS, DR. ROBERT, U.S. medical educator	Mar. 8, 1862	Dec. 20
LILJEFORS, BRUNO, Swedish painter	1860(?)	Dec. 18
*LINDEMANN, FERDINAND VON, German mathematician	Apr. 12, 1852	Mar. 7
*LINDGREN, WALDEMAR, U.S. geologist	Feb. 14, 1860	Nov. 3
LINDSAY, SIR CHARLES WILLIAM, Canadian business executive and worker for blind	Apr. 6, 1856	Nov. 7
LINDSEY, JOSEPH BRIDGEO, U.S. chemist	Dec. 20, 1862	Oct. 27
*LINDBERGER, PAUL MYRON WENTWORTH, U.S. jurist	June 15, 1871	Feb. 20
*LINN, JAMES WEBER, U.S. educator, legislator, and writer	May 11, 1876	June 14
*LINTON, EDWIN, U.S. biologist	Mar. 14, 1855	July 4
*LIPMAN, JACOB GOODALE, U.S. agricultural chemist	Nov. 18, 1874	Apr. 19
LISTER, SIR (FREDERICK) SPENCER, South African bacteriologist	Apr. 8, 1876	Sept. 6
LOBINGROFF, DR. ANDREW STEWART, U.S. surgeon	Dec. 22, 1862	July 31
*LOGAN, MARVEL MILLS, U.S. Senator	Jan. 7, 1874	Oct. 3
LOMBARD, DR. WARREN PLIMPTON, U.S. physiologist	May 29, 1853	July 13
LONGONE, PAUL, U.S. operatic producer	Jan. 3, 1886	Aug. 3
LORD, HERT, U.S. Congressman	Dec. 4, 1860	May 24
LOUIS, HENRY, British mining engineer	Dec. 7, 1855	Feb. 22
*LOUISE, PRINCESS; DUCHESS OF ARGYLL, British princess	Mar. 18, 1848	Dec. 3
LOVEJOY, THOMAS E., U.S. insurance executive	Sept. 16, 1875	Dec. 12
LOVELL, JOHN HARVEY, U.S. biologist	Oct. 21, 1860	Aug. 2
LUNN, SIR HENRY, British philanthropist	July 30, 1859	Mar. 18
LYNCH, JOHN ROY, U.S. Negro Congressman	Sept. 10, 1847	Nov. 2
LYONS, REV. CHARLES WILLIAM, U.S. educator	Jan. 31, 1863	Jan. 31
*LYONS, JOSEPH ALOYSIUS, Australian statesman	Sept. 15, 1879	Apr. 7
MCCLEURE, SIR WILLIAM, British journalist	Apr. 15, 1877	Apr. 23
MCCORMICK, REV. JOHN NEWTON, U.S. Episcopal bishop	Feb. 1, 1863	Nov. 26
MACDONNELL, ARCHIBALD HAYES, Canadian Senator	Feb. 6, 1868	Nov. 12
MAC DOUGALL, ROBERT, U.S. psychologist	June 12, 1866	Oct. 31
MACHADO, ANTONIO, Spanish poet	1875	Feb. 23
*MACHADO Y MORALES, GERARDO, Cuban politician	Sept. 29, 1871	Mar. 29
*MACKAY, WILLIAM ANDREW, U.S. painter	July 10, 1876	July 26
MACLAREN, ALEXANDER, Canadian lumber executive	Feb. 27, 1860	July 9
MCCLAUGHLIN, MARY LOUISE, U.S. ceramist	Sept. 28, 1847	Jan. 17
MCLEAN, ALFRED EDGAR, Canadian legislator	May 8, 1868	Oct. 28
MCLENNAN, JOHN STEWART, Canadian Senator and publisher	Nov. 5, 1853	Sept. 15
MCMAHON, JOSEPH H., U.S. Catholic clergyman	Nov. 18, 1862	Jan. 6
MCMECHAN, DR. FRANCIS HOFFER, U.S. anaesthetist	Jan. 16, 1879	June 29
*MCMILLAN, JOHN, British Salvation Army officer	1873	Sept. 22
*MCMILLAN, THOMAS SANDERS, U.S. Congressman	Nov. 27, 1888	Sept. 29
MACPHERSON, JAMES ERNEST, Canadian public utilities executive	Dec. 11, 1870	Mar. 7
*MCREYNOLDS, SAMUEL DAVIS, U.S. legislator	Apr. 10, 1872	July 11
MADIGAN, MICHAEL J., U.S. editor	Aug. 28, 1867	Nov. 14
MAGILL, ROBERT EDWARD, U.S. church officer	Sept. 23, 1861	May 4
MAHER, DR. STEPHEN, JOHN, U.S. physician	Apr. 12, 1860	June 6
MA HSIANG-PAI, Chinese scholar	1839	Nov. 4
MANGUM, DR. CHARLES STABLES, U.S. medical educator	July 14, 1870	Sept. 29
MARFES, CARL EDGAR, U.S. Congressman	Dec. 20, 1874	Dec. 12
MARFES, THOMAS STONE, U.S. educator	Feb. 26, 1868	Jan. 13
*MARIANI, DOMENICO, Italian cardinal	Apr. 3, 1863	Apr. 23
MARKOVIC, ENO, Yugoslav financier	(?)	Dec. 18
*MARTIN, EDWARD SANDFORD, U.S. author and editor	Jan. 2, 1856	June 13
*MARTIN, HELEN REMIENSKY, U.S. author	Oct. 18, 1868	June 29
MARTIN, JOHN ANDREW, U.S. Congressman	Apr. 29, 1868	Dec. 23
MARVIN, FRED RICHARD, U.S. editor	Dec. 22, 1868	July 14
MARK, CHARLES DAVID, U.S. civil engineer and professor	Oct. 10, 1857	Dec. 31
MASON, CAROLINE ATWATER, U.S. author	Oct. 10, 1857	May 2
*MASON, WALT, U.S. writer	May 4, 1862	June 22
*MAX, ADOLPHE, Belgian burgomaster	Dec. 31, 1860	Nov. 6
MAXWELL, CHARLES ROBERT, U.S. educator	Jan. 10, 1878	Sept. 14
*MAYO, DR. CHARLES HORACE, U.S. surgeon	July 19, 1865	May 26
*MAYO, DR. WILLIAM JAMES, U.S. surgeon	June 29, 1861	July 28
*MENDELSON, CHARLES JASTROW, U.S. cryptographer and philologist	Dec. 8, 1880	Sept. 27
*MERCER, BERYL, U.S. actress	1882	July 28
*MERRICK, LEONARD, British author	Feb. 21, 1861	Aug. 7
MERRIMAN, THADDEUS, U.S. engineer	Apr. 6, 1876	Sept. 26
METCALF, RALPH, U.S. editor and legislator	Nov. 2, 1861	Apr. 14
MEYERS, GEORGE JULIAN, U.S. rear admiral	Apr. 10, 1881	Dec. 7
MIDDLETON, EDGAR, British author	Nov. 26, 1891	Apr. 10
MILLAR, REV. WILLIAM BELL, U.S. church leader	1866	May 30
MILLER, CHARLES ERVINE, U.S. educator	Feb. 24, 1867	Jan. 10
*MILLER, JOSEPH DANA, U.S. economist	July 1, 1864	May 8
MILLER, RUSSELL KING, U.S. organist and composer	May 10, 1871	May 3
MILLER, DR. WILLIAM SNOW, U.S. anatomist	Mar. 29, 1858	Dec. 26
MITCHELL, DR. CLIFFORD, U.S. urologist and author	Jan. 28, 1854	Oct. 19
MOFFETT, REV. SAMUEL AUGUST, U.S. missionary	Jan. 25, 1864	Oct. 24
*MONTELL, FRANK WHEELER, U.S. legislator	Nov. 6, 1860	Aug. 6
MONTELLI, UGO, Italian seismologist	Mar. 1, 1876	Dec. 3
MONROE, WILLIAMS, U.S. psychologist and author	Mar. 22, 1863	Jan. 29
MOORE, OWEN, U.S. actor	Jan. 3, 1872	Dec. 18
MOOREHEAD, WARREN KING, U.S. archaeologist	Dec. 12, 1886	June 9
MORGAN, JAMES HENRY, U.S. educator	Mar. 10, 1866	Jan. 5
MOSQUERA NARVAEZ, AURELIO, president of Ecuador	Jan. 21, 1857	Oct. 17
MOUNT TEMPLE, 1st Baron (WILFRID WILLIAM ASHLEY), British statesman	1883(?)	Nov. 17
MUCHA, Czech artist	Sept. 13, 1867	July 3
MURHEAD, ANTHONY JOHN, British legislator	Nov. 4, 1800	Oct. 20
*MUNDELEIN, GEORGE WILLIAM, U.S. cardinal	July 2, 1872	Oct. 2
MUNDIE, WILLIAM BRYCE, U.S. architect	Apr. 30, 1863	Mar. 27

Name	Birth date	Death date
MUNRO, DR. WALTER LEE, U.S. surgeon	Sept. 4, 1857	Oct. 23
MURPHY, REV. JOSEPH A., U.S. Catholic bishop	Dec. 24, 1857	Nov. 25
MURRAY, WILLIAM D., U.S. lawyer and youth leader	July 17, 1858	Nov. 20
*NAISMITH, DR. JAMES A., U.S. physical director	Nov. 6, 1861	Nov. 28
NEAL, ROBERT WILSON, U.S. educator	Apr. 2, 1871	May 6
NEELD, REGINALD RUNDLELL, British admiral	Oct. 10, 1850	Aug. 1
NEILSON, DR. THOMAS RUNDLE, U.S. surgeon and educator	Oct. 29, 1857	Oct. 25
*NEUMANN, DR. HEINRICH, Austro-Hungarian otologist	June 16, 1873	Nov. 6
NEUMANN, DR. WILHELM, German physician	1884(?)	Dec. 30
NEVILL, LORD RICHARD (PLANTAGENET), British aide to Royal family	Jan. 13, 1864	Dec. 3
NICHOLL, SIR EDWARD, British shipping executive	June 17, 1862	Mar. 31
NICHOLSON, REGINALD FAIRFAX, U.S. rear admiral	Dec. 10, 1852	Dec. 10
NIEMIROWER, REV. JACOB ISAAC, Rumanian rabbi	1872	Nov. 18
NODA, HIDEO, Japanese-American painter	July 15, 1908	Jan. 12
NOE, ADOLF CARL, U.S. palaeobotanist	Oct. 28, 1873	Apr. 10
NORMAN, SIR HENRY, British journalist	Sept. 10, 1858	June 4
NORTON, ARTHUR HENRY, U.S. educator	Dec. 9, 1870	Apr. 30
NORTON, CHARLES LADD, U.S. engineer	Dec. 11, 1870	Sept. 8
*OCHILVIE, ALBERT GEORGE, premier of Tasmania	Mar. 10, 1891	June 11
OCHILVIE GORDON, DAME MARIA M., British geologist	(?)	June 24
*O'HAGAN, THOMAS, Canadian author	Mar. 6, 1855	Mar. 2
OKA, MINORU, Japanese publisher	Sept. 1873	Nov. 20
OLDENBURG, ANDREAS, Danish diplomat	1877	Sept. 9
*OLIPHANT, HERMAN, general counsel of U.S. Treasury	Aug. 31, 1884	Jan. 11
*O'MALLEY, WILLIAM, Irish Nationalist leader	1853	Sept. 12
OMWAKE, JOHN, U.S. manufacturer	Jan. 13, 1855	Apr. 23
ORR, WILLIAM, U.S. educator and author	Nov. 16, 1860	July 21
ORTEIG, RAYMOND, U.S. restaurateur and donor of first transatlantic flight prize	Jan. 29, 1870	Sept. 6
O'SHEA, JOHN AUGUSTINE, U.S. organist and educator	Oct. 15, 1864	June 16
O'SHEA, WILLIAM JAMES, U.S. educator	Oct. 10, 1863	Jan. 16
OWEN, EMMETT MARSHALL, U.S. legislator	1877	June 21
OWEN, SIR JAMES GEORGE, British publisher	Aug. 29, 1869	July 8
PADDOCK, REV. ROBERT LEWIS, U.S. Episcopal bishop	Dec. 24, 1869	May 17
PALMER, CHARLES SKEELE, U.S. chemist	Aug. 4, 1858	Nov. 30
PANCOAST, HENRY KHUNRATH, U.S. radiologist	Feb. 20, 1875	May 20
PANZINI, ALFREDO, Italian novelist	Dec. 31, 1863	Apr. 11
*PARK, DR. WILLIAM HALLOCK, U.S. public health authority	Dec. 30, 1863	Apr. 6
PARKER, EMMETT NEWTON, U.S. jurist	May 12, 1859	Dec. 8
PARKER, GEORGE A., U.S. educator	Sept. 21, 1856	July 3
*PARSONS, WILLIAM EDWARD, U.S. architect	June 19, 1872	Dec. 17
PATTISON, WILLIAM J., U.S. publisher	Feb. 11, 1870	Dec. 27
PATTON, REV. CORNELIUS HOWARD, U.S. clergyman and author	Dec. 25, 1860	Aug. 17
PAXON, FREDERIC JOHN, U.S. merchant	July 22, 1865	June 29
PEABODY, CHARLES, U.S. educator and museum curator	Nov. 9, 1867	Aug. 17
*PEARSON, ALFRED JOHN, U.S. educator and diplomat	Sept. 29, 1869	Aug. 10
PEARSON, RAYMOND ALLEN, U.S. educator	Apr. 9, 1873	Feb. 13
PEASE, SIR ALFRED EDWARD, British explorer	June 29, 1857	Apr. 27
PHILLIPS, NELSON, U.S. jurist	May 3, 1873	Mar. 31
PILLSBURY, CHARLES STINSON, U.S. mill executive	Dec. 6, 1878	May 21
*PIUS XI, Pope	May 31, 1857	Feb. 10
PLANT, OSCAR HENRY, U.S. pharmacologist	Sept. 30, 1875	Oct. 1
PLUMB, CHARLES SUMNER, U.S. educator	Apr. 21, 1860	Mar. 4
*POND, IRVING KANE, U.S. architect	May 1, 1857	Sept. 29
POOLE, REGINALD LANE, British historian	Mar. 29, 1857	Oct. 28
*POPE, SIR WILLIAM JACKSON, British chemist	Mar. 31, 1870	Oct. 17
PORTER, ALFRED WILLIAM, British physicist	Nov. 12, 1863	Jan. 13
POTTS, DR. WILLIAM ALEXANDER, British psychologist	1860	July 23
POWERS, THOMAS E., U.S. cartoonist	July 4, 1870	Aug. 14
POWYS, LEWELYN, British author	Aug. 13, 1884	Dec. 2
PRANCE, JOSEPH G., U.S. founder of Kiwanis International	Apr. 8, 1881	Feb. 20
PRATT, WALDO SELDEN, U.S. musician and professor	Nov. 10, 1857	July 29
PRICE, FRANK J., U.S. author and editor	Mar. 8, 1860	Oct. 6
PRICE, HICKMAN, U.S. agriculturist	June 9, 1886	Dec. 14
PRICE, JESSE DASHELL, U.S. legislator	Aug. 15, 1863	May 15
*PRITCHETT, HENRY SMITH, U.S. educator and scientist	Apr. 16, 1857	Aug. 28
PRYSTOR, ALEXANDER, Polish statesman	1875	Sept. 20(?)
PUJO, ARSENE PAULIN, U.S. Congressman	Dec. 16, 1861	Dec. 31
*PULTIZER, RALPH, U.S. publisher	June 11, 1879	June 14
PUTNAM, EDWARD KIRBY, U.S. museum director	Nov. 17, 1868	May 22
QUAST, FERDINAND VON, German general	Oct. 18, 1850	Mar. 28
*RACKHAM, ARTHUR, British illustrator	Sept. 19, 1867	Sept. 6
RAMSAY, SIR WILLIAM MITCHELL, British explorer	Mar. 15, 1851	Apr. 21
RAMSDEN, OMAR, British goldsmith	Aug. 21, 1873	Aug. 14
RANK, OTTO, Austrian psychologist	Apr. 22, 1884	Oct. 37
RATHVON, WILLIAM ROEDEL, U.S. Christian Science leader	Dec. 27, 1854	Mar. 2
RAY, SIR SIDNEY HERBERT, British ethnologist	May 28, 1858	Jan. 3
*READ, OPIE, U.S. author	Dec. 22, 1852	Nov. 2
REEVES, IRA LOUIS, U.S. engineer and soldier	Mar. 8, 1872	Oct. 23
RHAYADER, LEIFCHILD STRATTEN LEIF-JONES, 1st Baron, British liberal leader	Jan. 16, 1862	Sept. 26
RHINELANDER, REV. PHILIP MERCER, U.S. Episcopal bishop	1869	Sept. 21
RIANO Y GAYANGOS, JUAN, Spanish-American diplomat	Mar. 24, 1865	Nov. 18
RICE, WALLACE (DE GROOT CECIL), U.S. author	Nov. 10, 1859	Dec. 15
RICHARDSON, JAMES ARMSTRONG, Canadian financier	Aug. 21, 1881	June 26
*RICHTMYER, FLOYD KARKER, U.S. physicist	Oct. 12, 1885	Nov. 7
RIESENBERG, FELIX, U.S. engineer and author	Apr. 9, 1879	Sept. 10
RIESENFELD, HUGO, U.S. musician and conductor	Jan. 26, 1885	July 12
*RINTREF, FERNAND, Canadian statesman	Feb. 28, 1883	July 12
RITCHIE, JOHN, U.S. conchologist, author, and health expert	1853	July 22
ROBERTSON, JOSEPH ANDREW, U.S. industrialist	Dec. 31, 1889	Sept. 15
ROBINSON, ROBERT P., U.S. politician	Mar. 28, 1869	Mar. 4
*ROGERS, JAMES HARVEY, U.S. economist	Sept. 25, 1856	Aug. 13
ROGERS, DR. JOHN, U.S. surgeon	Feb. 19, 1866	Nov. 10
ROTHBACH, ADOLF, German aeroplane designer	1888(?)	July 8
ROTHMER, LOUIS, U.S. artist	Sept. 12, 1872	Nov. 30
ROSENTHAL, ALBERT, U.S. artist	Jan. 30, 1863	Dec. 20
*ROSS, JAMES DELMAGE, U.S. engineer	Nov. 9, 1871	Mar. 14
*ROSS, JOHN DAWSON, U.S. author and librarian	Oct. 23, 1853	Oct. 29
ROSSI, ENRICO, Italian count and liquor manufacturer	July 28, 1873	Oct. 10
ROTH, JOSEPH, Austrian novelist	Sept. 2, 1804	May 29
ROUTELEDGE, SCORESBY, Australian author	1859	July 31
ROUTZAHN, EVART GRANT, U.S. social worker	Jan. 6, 1869	Apr. 24

Name	Birth date	Death date
ROWE, JOSEPH EUGENE, U.S. educator, mathematician, and ballistics expert	Mar. 21, 1883	Oct. 2
*RUPPERT, JACOB, U.S. brewing and baseball executive	Aug. 5, 1867	Jan. 13
RYAN, WILLIAM HENRY, U.S. Congressman	May 10, 1860	Nov. 18
SAAVEDRA, JUAN BAUTISTA, Bolivian statesman	Aug. 30, 1870	Mar. 1
*SAITO, HIROSI, Japanese diplomat	Dec. 24, 1886	Feb. 26
SAMPSON, RALPH ALLEN, British astronomer	1866	Nov. 10
SANDERSON, HENRY SANDERSON FURNISS, 1st Baron, of HUNMANBY, British educator	1868	Mar. 25
SAPIR, EDWARD, U.S. anthropologist and linguist	Jan. 26, 1884	Feb. 4
SARABIA TINOCO, FRANCISCO, Mexican aviator	July 3, 1900	June 7
*SARGENT, JOHN GARIBALDI, former U.S. attorney-general	Oct. 13, 1860	Mar. 5
*SASSOON, SIR PHILIP (ALBERT GUSTAVE DAVID), British statesman	Dec. 4, 1888	June 3
*SAUVEUR, ALBERT, U.S. metallurgist	June 21, 1863	Jan. 26
SAWYER, SAMUEL NELSON, U.S. jurist	Oct. 6, 1853	May 1
*SBARRETTI, DONATO, Italian cardinal	Nov. 12, 1856	Apr. 1
SCANLAN, JOSEPH D., U.S. publisher	Mar. 9, 1876	Aug. 9
*SCHEIDEMANN, PHILIPP, German statesman	July 26, 1865	Nov. 20
*SCHELLING, ERNEST HENRY, U.S. musician	July 26, 1876	Dec. 8
*SCHNEIDER, HERMAN, U.S. engineer and educator	Sept. 12, 1872	Mar. 28
*SCHWAB, CHARLES MICHAEL, U.S. industrialist	Feb. 18, 1862	Sept. 18
SEAWELL, EMERY, U.S. jurist	Apr. 5, 1862	July 7
*SELIGMAN, EDWIN R. A., U.S. economist	Apr. 25, 1861	July 1
SERLY, LAJOS, Hungarian-American musician and author	Mar. 13, 1855	Feb. 18
SHERMAN, LAWRENCE Y., U.S. Senator	Nov. 8, 1858	Sept. 15
SHEREVE, MILTON WILLIAM, U.S. Congressman	May 3, 1858	Dec. 23
SHUTTLEWORTH, UGHTRIED JAMES KAY-SHUTTLEWORTH, 1st Baron, of GAWTHORPE, British M.P.	Dec. 18, 1844	Dec. 20
SILCOX, FERDINAND AUGUSTUS, chief of U.S. Forest Service	Dec. 25, 1882	Dec. 20
SIMPSON, FRED BROWN, British M.P.	Nov. 6, 1886	Sept. 23
*SIMPSON, JAMES, U.S. business executive and civic leader	Jan. 26, 1874	Nov. 25
SMIS, THETUS WILLETTE, U.S. Congressman	Apr. 25, 1852	Dec. 17
SIMOVICH, DR. WILLIAM IRVING, U.S. Congressman and physician	Mar. 18, 1882	Dec. 17
SJOGREN, DR. TAGE, Swedish roentgenologist	Aug. 26, 1859	Jan. 10
SKINNER, CONSTANCE LINDSAY, U.S. author	(?)	Mar. 27
*SLAWEK, WALERY, Polish statesman	Apr. 2, 1870	Apr. 3
SLEDDE, ANDREW, U.S. educator and author	Nov. 7, 1870	Mar. 16
SMITH, ALFRED THEODORE, U.S. brigadier general	Nov. 25, 1874	Nov. 27
SMITH, EDMUND HYDE, British admiral	June 1863	July 13
SMITH, ELMER DENNISON, U.S. horticulturist	Nov. 20, 1854	Nov. 10
SMITH, GEORGE TUCKER, U.S. rear admiral	May 6, 1866	Mar. 18
SMITH, REV. ROBERT SENECA, U.S. educator	Nov. 18, 1880	Jan. 15
SMITH, DR. SAMUEL CALVIN, U.S. heart specialist	Feb. 28, 1881	July 31
SMITH, WILFORD BASCOM ("PITCHFORK"), U.S. editor	Mar. 17, 1884	July 10
*SNELLING, CHARLES MERCER, U.S. educator	Nov. 3, 1862	Sept. 19
*SNIJDERS, CORNELIS JACOBUS, Dutch general	Sept. 29, 1852	May 26
SNOW, ELLIOT, U.S. rear admiral	June 27, 1866	Nov. 27
SPENCER, LORILLARD, U.S. soldier and aviation official	July 4, 1883	June 9
SPICER, CLARENCE WINFRED, U.S. inventor and manufacturer	Nov. 30, 1875	Nov. 21
*SPINGARN, JOEL ELIAS, U.S. professor and author	May 17, 1875	July 26
SQUIRES, EDITH LOMBARD, U.S. poet	Apr. 18, 1884	June 2
STABLER, LAIRD JOSEPH, U.S. educator, inventor and chemist	Aug. 27, 1865	Nov. 26
STAUNTON, SIDNEY AUGUSTUS, U.S. rear admiral	June 7, 1850	Jan. 11
*STEINER, FREDERICK, U.S. Senator	Oct. 13, 1883	Feb. 3
*STENGEL, DR. ALFRED, U.S. physician and educator	Nov. 3, 1868	Apr. 10
STEPHANI, FRIEDRICH FRANZ ADOLF VON, German major; founder of Steel Helmets	June 12, 1876	Apr. 26
STERLING, ADA, U.S. author	Feb. 25, 1863	Sept. 1
STERLING, FORD, U.S. motion picture actor	Nov. 3, 1883	Oct. 13
*STEVENSON, REV. JOSEPH ROSS, U.S. minister and educator	Mar. 1, 1866	Aug. 13
STEWART, ALEXANDER MAIR, U.S. builder	Oct. 2, 1857	Dec. 21
STEWART, SAMUEL VERNON, U.S. attorney and State governor	Aug. 2, 1872	Sept. 15
*STOCKARD, DR. CHARLES RUPERT, U.S. biologist	Feb. 27, 1879	Apr. 7
STODDARD, ARCHIBALD PEILE, British admiral	Sept. 5, 1860	Dec. 10
STOKES, FREDERICK ABBOT, U.S. publisher	Nov. 4, 1857	Nov. 15
STRONG, NATHAN LEROY, U.S. Congressman	Nov. 12, 1850	Dec. 14
STUART-JONES, SIR HENRY, British scholar	May 15, 1867	June 29
STURTEVANT, JOHN LOOMIS, U.S. publisher	Mar. 18, 1865	May 17
SUMMERBELL, REV. MARTYN, U.S. clergyman and educator	Dec. 20, 1847	Sept. 12
*SUPER, CHARLES WILLIAM, U.S. educator	Sept. 12, 1842	Oct. 9
*SWANSON, CLAUDE AUGUSTUS, U.S. secretary of Navy	Mar. 31, 1862	July 7
SWINDALL, CHARLES, U.S. jurist	Feb. 13, 1876	June 18
TAIT, REV. GEORGE WHEATON, U.S. theologian	July 17, 1865	Jan. 21
TALMAGE, ALGERNON, British artist	1869(?)	Sept. 14
TANAHASHI, AYARO, Japanese educator	Mar. 25, 1838	Sept. 23
*TANNERY, JEAN, French financier	Dec. 31, 1878	July 7
TARR, WILLIAM ARTHUR, U.S. mineralogist and geologist	Mar. 29, 1881	July 28
TATE, FRANK, Australian educator	June 18, 1863	June 28
*TATSCH, JACOB HUGO, U.S. Masonic leader	Jan. 29, 1888	July 17
TAVERA, CHARLES-JOSEPH, French admiral	1885	Oct. 31
TAYLOR, J. WILL, U.S. Congressman	Aug. 28, 1880	Nov. 14
TAYLOR, RICHARD V., U.S. Federal and city official	Aug. 11, 1859	Dec. 21
TCHENG LOH (CH'EN LU), Chinese politician	1878	Feb. 20
TELESKY, JOHN, Hungarian financier	1868	June 13
*TEMPERLEY, HAROLD WILLIAM VAZELLE, British historian	Apr. 29, 1879	July 11
TEMPLETON, FAY, U.S. actress	Dec. 25, 1865	Oct. 3
TEMPLETON, HENRY EDWARD MONTAGU DORINGTON	Apr. 29, 1853	Oct. 2
CLOTWORTHY UPTON, 4TH VISCOUNT, Irish peer	Sept. 21, 1885	Aug. 10
TERRY, (JOSEPH EDWARD) HAROLD, British author	May 12, 1868	July 9
*THOMASHEFSKY, BORES, U.S. Yiddish actor	May 12, 1868	July 9
THOMPSON, ANDREW THORNBURN, Canadian legislator and soldier	May 27, 1870	Apr. 20
THOMPSON, EBEN FRANCIS, U.S. lawyer and author	Jan. 29, 1859	Dec. 2
THOMPSON, DR. FREDERICK HENRY, U.S. surgeon	Aug. 5, 1844	Dec. 14
THOMPSON, WADDEY, U.S. historian	Aug. 13, 1867	Mar. 10
*THOMSON, SIR BASIL, British police commissioner	Apr. 21, 1861	Mar. 26
THORNDIKE, DR. PAUL, U.S. surgeon	Mar. 2, 1863	May 28
THORNTON, ALFRED H.R., British painter	1863	Feb. 20
*TODD, DAVID, U.S. astronomer	Mar. 19, 1855	June 1
*TOLLER, ERNST, German poet	Dec. 1, 1893	May 22
TOWER, GEORGE WARREN, JR., U.S. geologist and engineer	Oct. 27, 1871	Sept. 13
TOWER, SIR REGINALD, British diplomat	Sept. 1, 1860	Jan. 21
TOWNSEND, JULIUS CURTIS, U.S. rear admiral	Feb. 22, 1881	Dec. 23

Name	Birth date	Death date
TOWNSEND, MARION ERNEST, U.S. educator	May 16, 1880	Dec. 21
TRENT, WILLIAM PETERFIELD, U.S. professor	Nov. 10, 1862	Dec. 6
TRINKLE, ELBERT LEE, U.S. State governor	Mar. 12, 1876	Nov. 25
TUBELIS, JUOZAS, Lithuanian statesman	(?)	Oct. 1
TUCKER, BENJAMIN R., U.S. author	Apr. 17, 1854	June 22
TURK, REV. MORRIS HOWLAND, U.S. clergyman	June 2, 1867	Mar. 2
VAILLANT, CHARLES, French radiologist	1872(?)	Dec. 4
*VALDEMAR, prince of Denmark	Oct. 27, 1858	Jan. 14
VANCE, REV. JAMES ISAAC, U.S. minister	Sept. 25, 1862	Nov. 24
VAN DER GOES, FRANK, Dutch socialist	Feb. 13, 1850	June 5
VANDERPOEL, EMILY C. NOYES, U.S. painter and author	1841(?)	Feb. 20
*VAN DINE, S. S. (WILLARD HUNTINGTON WRIGHT), U.S. author	1888	Apr. 11
VAN DYKE, JOHN WESLEY, U.S. petroleum executive	Dec. 27, 1849	Sept. 13
VERIGIN, PETER, Canadian leader of Doukhobors	Mar. 11, 1885	Feb. 11
VERNON, ROBERT, U.S. motion picture actor	Mar. 9, 1897	June 28
VILDOSOLA, SILVA, Chilean editor	1870(?)	Dec. 22
VILLAZÓN, ELIODORO, Bolivian statesman	Jan. 22, 1848	Sept. 12
VILLIERS, EDWARD CECIL, British admiral	1866	Apr. 16
WAGNER, GERHARD, German physician	Aug. 18, 1888	Mar. 25
WAD, DAN EVERETT, U.S. architect	Mar. 31, 1863	Oct. 31
WAIN, LOUIS WILLIAM, British illustrator	Aug. 5, 1862	July 4
WALDO, DWIGHT BRYANT, U.S. educator	June 13, 1864	Oct. 29
WALGREEN, CHARLES RUDOLPH, U.S. drug store executive	Oct. 9, 1873	Dec. 11
WALKER, ARTHUR GEORGE, British sculptor	Oct. 20, 1861	Sept. 14
WALKER, HUGH, British author	Jan. 7, 1855	June 28
WALKER, LAFSLEY GREENE, U.S. editor	July 20, 1854	July 12
WALLACE, DILLON, U.S. explorer and author	June 23, 1863	Sept. 28
WALLACE, JAMES, U.S. educator	Mar. 13, 1849	Aug. 23
*WALSH, FRANK PATRICK, U.S. attorney	July 20, 1864	May 2
WALSH, RAYMOND ARNOLD, U.S. editor and jurist	June 17, 1880	June 6
WARE, HELEN (HELEN REMER), U.S. actress	Oct. 15, 1877	Jan. 25
WARFIELD, RALPH MERVINE, U.S. rear admiral	Sept. 12, 1880	Mar. 21
WARREN, ALBERT EDWARD, Canadian railroad official	June 9, 1874	Oct. 16
WARRINGTON, ALBERT POWELL, U.S. theosophist	Aug. 27, 1866	June 16
WARRUM, HENRY, U.S. labour counsel	June 19, 1867	Apr. 18
WASHBURN, MARGARET FLOY, U.S. professor	July 23, 1871	Oct. 29
WATSON, JOHN JAY, U.S. industrialist	Nov. 12, 1874	Mar. 30
*WEBER, REV. HERMAN CARL, U.S. clergyman and editor	Feb. 9, 1873	July 25
WEBER, LOIS (MRS. HARRY GANTZ), U.S. motion picture director	June 13, 1886	Nov. 13
WELS, OTTO, German socialist	1873	Sept. 17
*WESTERMARK, EDWARD ALEXANDER, Finnish sociologist and anthropologist	Nov. 20, 1862	Sept. 3
WHALLON, REV. EDWARD PAYSON, U.S. minister and editor	Mar. 30, 1849	June 3
WHITE, J. DU PRATT, U.S. lawyer and civic leader	July 25, 1860	July 14
WHITELEY, EMILY STONE, U.S. historian	May 8, 1868	Sept. 3
WHITMAN, RUSSELL RIPLEY, U.S. publisher	Oct. 31, 1868	Oct. 12
WHITNEY, JAMES POUNDER, British historian	Nov. 30, 1857	June 17
WICKERSHAM, JAMES, Alaskan legislator, jurist and author	Aug. 24, 1867	Oct. 24
WIENER, LEO, U.S. philologist and historian	July 26, 1862	Dec. 12
*WILD, FRANK, British explorer	1874	Aug. 20
WILLIAMS, HERBERT OSWALD, U.S. consul	June 30, 1873	Aug. 17
WILLIAMS, DR. LEONARD LLEWELYN BULKELEY, British gland authority	Oct. 2, 1861	Aug. 20
WILLIAMS, DR. LOUIS LAVAL, U.S. public health authority	1859	Sept. 17
WILLIAMS, VASILY ROBERTOVICH, Russian scientist	1863	Nov. 11
WILLIAMSON, SYDNEY BACON, U.S. engineer	Apr. 15, 1865	Jan. 13
*WILSON, CLARENCE TRUE, U.S. reformer	Apr. 24, 1872	Feb. 16
WILSON, EDMUND BEECHER, U.S. zoologist	Oct. 19, 1856	Mar. 3
*WILSON, HARRY LEON, U.S. author	May 1, 1867	June 28
WILSON, HENRY VAN PETERS, U.S. biologist	Feb. 16, 1863	Jan. 4
WILSON, SAMUEL DAVIS, U.S. politician	Aug. 31, 1881	Aug. 19
WIMBORNE, VISCOUNT (IVOR CHURCHILL GUEST), British statesman	Jan. 16, 1873	June 14
WINCHELSEA AND NOTTINGHAM, GUY MONTAGU GEORGE		
WINCH-HATTON, EARL OF, British peer	May 28, 1885	Feb. 10
WINDISCHGAEZT, RUDOLPH VON, Austrian prince	Feb. 4, 1907	June 9
WINSOR, FRANK EDWARD, U.S. civil engineer	Nov. 16, 1870	Jan. 30
WISE, REV. JAMES, U.S. Episcopal bishop	July 26, 1875	July 8
*WOOD, HENRY ALEXANDER WISE, U.S. inventor and manufacturer	Mar. 1, 1866	Apr. 9
WOODMAN, JOSEPH EDMUND, U.S. geologist	July 3, 1873	May 19
*WOODS, DR. FREDERICK ADAMS, U.S. biologist	Jan. 29, 1873	Nov. 5
WOODSON, UREY, U.S. publisher and governmental official	Aug. 16, 1859	Aug. 7
WOODWARD, ELLSWORTH, U.S. artist and educator	July 14, 1861	Feb. 28
WOODWARD, JOHN CHARLES, U.S. military educator	July 14, 1866	Aug. 27
WORTHINGTON, SIR PERCY, British architect	Jan. 31, 1864	July 15
WRIGHT, JOSEUA BUTLER, U.S. diplomat	Oct. 18, 1877	Dec. 4
WUERTEMBERG, ALBRECHT, German duke and field marshal	Dec. 23, 1865	Oct. 29
*WU PEI-FU, Chinese soldier and poet	1873	Dec. 4
*YEATS, WILLIAM BUTLER, Irish poet	June 13, 1865	Jan. 28
YOUNG, DR. ARCHIBALD, Scotch surgeon	Nov. 10, 1873	July 23
YSENBURG, KARL VON, Austrian princess	Mar. 16, 1872	Apr. 25
ZELENY, CHARLES, U.S. zoologist	Sept. 17, 1878	Dec. 21
*ZENGAIS, GUSTAV, Latvian statesman	Aug. 12, 1871	Jan. 7
ZIMMERMAN, ALFRED RUDOLF, Dutch statesman and diplomat	Jan. 19, 1860	July 2
ZIMMERN, ALICE, British feminist	Sept. 22, 1855	Mar. 22



SEVEN MILES OF STEEL ROPE, equipped with a core sampler and powder charge, were completed early in 1939 at the Carnegie Institute of Washington to plumb ocean floors for scientific data previously unknown to man

as mediums for the exchange of observations and ideas. The chief exception to a world-wide decrease in oceanographic activity is the recent announcement that the United States Bureau of Fisheries has made arrangements for the reconditioning of a trawler to study off-shore fisheries problems in the New England area.

Ocean Currents.—In Sept. 1939 the physical oceanographers attending the Washington meeting of the International Union of Geodesy and Geophysics reported on a number of interesting developments. The survey carried out, May–July 1938, in a restricted area north-west of the Azores by German and Norwegian ships indicates that even quite minor features of the bottom topography can influence the superficial current pattern in depths as great as 1,500 fathoms.

Both on the Atlantic and the Pacific coasts of the United States the tide gauge records have recently been studied in relation to fluctuations in the current systems along the coast. It has been found, for example, that the variations in the transport of the Gulf Stream are rather closely reflected by changes in mean sea-level at Miami and Charleston. There is a possibility that in some circumstances tide gauge observations may become helpful in forecasting the gradual trends in coastal climate.

In addition, there is some evidence to show that the success of certain fisheries depends largely on whether or not the current system disperses the eggs. When the currents are abnormal, many of the very young fish are carried off to deep water where they have little chance to survive. Thus a better knowledge of the variations in the currents is essential to fisheries investigations.

Plankton.—The floating population of small marine animals and plants are of course studied for their own sake, but during 1939 they also received attention for other reasons. Investigated quantitatively, the plankton provide information concerning the fertility of the sea. It has been found, for example, that although tropical waters are relatively sparsely populated, the total annual plankton crop may exceed that of northern coastal areas, which for short periods are often so extremely fertile that the waters

Obstetrics: see GYNAECOLOGY AND OBSTETRICS.

Ocean Liners: see SHIPBUILDING; SHIPPING, MERCHANT MARINE.

Oceanography. It is quite evident that the European war will have a serious effect on oceanographic research. Already the field work has been radically curtailed and such organizations as the International Council for the Exploration of the Sea and the North American Council for Fisheries Investigations are finding it difficult to continue their functions

become discoloured by the swarms of tiny creatures. There is a much longer growing season in low latitudes and the better penetration of sunlight permits plants to flourish over a considerable depth range. The plankton are also successfully being used for a study of the currents in the North sea and the English channel. The various primary water-masses, which are mixed in this region, each have a characteristic population. Thus marine biologists, by counting the numbers of certain indicator forms in each haul of a two-net survey, are able to gain information on the mixing which accompanies the rather complicated current system.

Submarine Geology.—The use of continuously recording sonic sounding equipment is bringing to light many interesting details of the bottom topography. Recently published charts of the continental shelf off the eastern coast of the United States not only adequately map the huge submarine canyons at its off-shore edge, but also show that the whole face of the continental slope has been eroded, presumably at the same time that the canyons were formed. (See also FISHERIES; MARINE BIOLOGY; ZOOLOGY.)

BIBLIOGRAPHY.—*The International Survey of the Gulf Stream Area*, published by International Assn. of Physical Oceanography (1939); "Some Physical Factors which May Influence the Productivity of New England's Coastal Waters," *Jour. of Marine Research*, Vol. II, No. 1 (1939); "Research within Physical Oceanography and Submarine Geology at the Scripps Institution of Oceanography during April 1938 to April 1939," *Transactions, American Geophysical Union, Part III* (1939); "Plankton Studies. II. The Western North Atlantic, May-June 1939," *Jour. of Marine Research*, Vol. II, No. 2 (1939); "Hydrographical and Biological Conditions in the North Sea as Indicated by Plankton Organisms," *Jour. du Conseil*, vol. xiv, No. 2 (1939); "Atlantic Submarine Valleys of the United States and the Congo Submarine Valley," *Geological Society of America, Special Papers*, No. 7 (1939). (C. O'D. I.)

Officers' Reserve Corps: see ARMIES OF THE WORLD: *Military Service*.

Ogilvie, Albert George (1891-1939), premier of Tasmania, was born at Hobart, Tasmania, on March 10. He received his degree of bachelor of laws from the University of Tasmania and was called to the bar in 1914. After building up a large practice he entered parliament in 1919 as a Labour member. Four years later he became attorney-general and minister of education in the Labour cabinet; in the same year he also held the portfolios of forestry and of mines. He became leader of the Tasmanian Labour Party in 1929 and was premier of Tasmania from 1934 until his death on June 11 at Warburton, Victoria, Australia.

O. Henry Memorial Awards: see LITERARY PRIZES: *United States*.

Ohio, north central State of the United States, popularly known as the "Buckeye State"; area, 41,040 sq.mi.; population (1930 census), 6,646,697, estimated July 1, 1937, 6,733,000. Capital, Columbus, with a population of 290,564 (1930). Other cities with over 100,000 were: Cleveland, 900,429; Cincinnati, 451,160; Toledo, 290,718; Akron, 255,040; Dayton, 200,982; Youngstown, 170,002; and Canton, 104,906. Of the State's population, 4,507,371 were urban, or 67.8%; native white 5,686,985; foreign born 644,151; and coloured, 309,304.

History.—An unemployment relief crisis and the efforts to fix the responsibility for it focused national attention on Ohio in the last two months of 1939. The General Assembly on May 26 enacted a \$317,000,000 budget for the 1939-40 biennium. Relief authorities and the large cities had asked that \$26,000,000 be voted for unemployment relief for the two-year period but when it was enacted the budget allotted only \$20,000,000 for that purpose or \$10,000,000 a year. Industrial employment was expanding and \$10,000,000 might have covered the relief needs except that the Federal Government at the order of Congress made drastic

cuts in the rolls of those holding Works Projects Administration jobs. So the number of persons on relief rose although industrial hiring increased.

In the last quarter of 1939 Toledo and Cleveland, industrial centres, found their relief funds at the vanishing point. They appealed to Gov. John W. Bricker to call a special session of the legislature so that additional funds might be voted. This the governor refused to do, holding that the cities had not done everything in their power to remedy the situation. He charged that political manipulation of WPA was partly responsible for Cleveland's difficulty and pointed out that at a special election in Toledo in September a relief levy was defeated, with only 11,622 persons voting in favour of it although there were 11,204 cases or nearly 33,000 people on the relief rolls. The governor's stand and his charges of WPA political manipulation brought heated retorts from President Roosevelt, Secretary of the Interior Harold L. Ickes and Col. Francis C. Harrington, Works Projects commissioner. By transferring funds intended for other purposes and with temporary help from Federal agencies, the cities were able to take care of the most desperate cases of need.

Ohio voters rejected decisively at the election November 7 a proposal to pay every person over 60 years of age a pension of \$50 a month regardless of need. Revenue was to be raised by a special land tax and a State income tax. The vote was 460,537 for and 1,527,577 against. This proposed amendment to the Ohio Constitution and another designed to make it easy for minorities to get other constitutional amendments and initiated laws on the ballot were sponsored by Herbert S. Bigelow. The vote on the initiative amendment was 403,749 for and 1,469,796 against.

Two other State issues were voted down at the same time. A constitutional amendment to establish a State Board of Education lost, 739,082 for and 1,118,704 against. The vote on a referendum bill to reorganize the State Civil Service Commission was 645,096 for and 1,110,471 against. Over the State, proposed bond issues and tax levies were voted down by the scores with school levies in general faring better than the others.

Gov. Bricker on August 26 appointed a Democrat, former Adj.-Gen. Frank D. Henderson, warden of Ohio penitentiary. Henderson succeeded James C. Woodard who was dismissed on March 25 on charges of favouring prisoners with wealthy or political connections and of permitting prison traffic in narcotics and liquor.

Opposition of residents of the 18-county Muskingum Watershed Conservancy district to increased taxes and assessments on benefited property induced the Federal Government to add to its original grant of \$22,090,000 toward the \$45,000,000 flood control project. When this additional contribution was made in 1939 management of the project was vested in the United States Army Engineers. Residents of the district then expressed the fear that under Federal control the development of recreation and wildlife conservancy programs that were originally contemplated around the 14 key dams would be neglected.

Effectiveness of Ohio's 3% sales tax was increased in May when the State began redeeming sales tax coupons for 3% of their face amount when submitted in amounts of at least \$100 face value. During the first six months this plan was in operation \$66,365 was paid out for coupons which had a total face value of \$2,212,185 and represented purchases of \$73,739,503. This system coupled with improved business conditions produced sales tax revenue for the first 10 months of 1939 that was nearly \$4,500,000 in excess of the revenue for the corresponding period in 1938.

Education.—After Toledo voters defeated a school tax by a two-to-one majority at the November 7 election, the city was forced to close the schools for the last six weeks of 1939 because it lacked funds to pay teachers and other employees. (P. By.)

Agriculture, Manufactures, Mineral Production.—Important crops, with provisional figures of production for 1939, are as follows: corn, 167,825,000bu.; soybeans, 7,854,000bu.; apples, 5,800,000bu.; tobacco, 28,160,000lb.; potatoes, 12,626,000bu.; wheat, 36,669,000bu.; oats, 35,490,000bu.; barley, 1,050,000bu.; tame hay, 3,487,000 tons. Corn in 1939 reached a record estimated yield of 49bu. per acre. Manufactures in 1937 were valued at \$5,099,816,893, with steel products, rubber tires, electrical machinery and motor vehicles leading. Total mineral output in 1937 was valued at \$131,025,104. Principal minerals were coal (\$44,313,000), clay products (\$24,329,083), natural gas (\$19,967,000), stone (\$9,426,808), coke (\$32,185,945), lime (\$8,653,571) and pig iron.

Oil: see PETROLEUM.

Oils and Fats, Vegetable and Animal: see VEGETABLE OILS AND ANIMAL FATS.

Oklahoma, the forty-sixth State of the United States, and popularly known as the "Sooner State," has a total area of 70,057 square miles. The population in 1930 was 2,396,040 (estimated July 1, 1937, as 2,548,000). The capital and largest city is Oklahoma City, population 185,389 (estimated, 1939, 225,000); the second largest city is Tulsa, 141,258 (estimated 160,000). Of the State's population, 821,681 were urban, or 31%; 2,095,671 were native white; 26,753, foreign-born white; 172,198, coloured; and 92,725, Indian.

History.—The year 1939 opened with the inauguration on January 9 of Leon C. Phillips as 11th governor. The 17th legislature remained loyal to the new governor and the session ended with little change in the way of taxation or increased appropriations. The heavy debt of the State has been constantly criticized by the governor and steps have been taken in an attempt to bring about a more economical State Government. In August the State forced all oil production to cease and for two weeks all State wells were shut down. The situation came as a result of similar action taken in Texas and was widely heralded as a price-fixing scheme. However, State officials stoutly maintain that production exceeded the market demand and that the purpose was conservation as State statutes define any production of oil over market demand as waste.

On the educational scene, strife appeared between the governor and the State department of education over issuance of the \$11,000,000 common school fund. In addition, control of the State teachers colleges was wrested from the State board of education and placed in the hands of a college board of regents. As a result of laws passed by the 17th legislature the so-called teachers colleges were changed to State colleges and in many instances changes were made in the administration of the schools. At present, the governor has the power to approve all institutional budgets by the quarter and to make any recommendations he feels are necessary for the economic stability of the State.

Education.—The educational institutions include the University of Oklahoma, Norman; Oklahoma Agricultural and Mechanical college, Stillwater; Panhandle Agricultural and Mechanical college, Goodwell; Oklahoma College for Women, Chickasha; Colored Agricultural and Normal university, Langston; six State colleges, formerly teachers colleges; four secondary agricultural schools; three junior colleges; with six independent senior colleges, and three independent junior colleges. There are 19 municipal junior colleges and 868 approved high schools. Elementary and high school district average daily attendance, 1939, was 497,120.

Charities and Corrections.—The hospital and eleemosynary institutions include three white mental hospitals located at Norman, Vinita and Supply; two tubercular hospitals at Clinton and

Talihina; two orphan homes at Helena and Whitaker; school for the deaf, Sulphur; school for the blind, Muskogee; Deaf, Blind, and Orphans' Home for Coloured Children, Taft; and the State Hospital for Negro Insane, Taft. The penal and corrective institutions include the State penitentiary at McAlester; Oklahoma State reformatory, Granite; Training School for White Boys, Pauls Valley; State Industrial School for White Girls, Tecumseh; and training schools for Negro boys at Boley and for Negro girls at Taft.

Banking and Finance.—Of the 77 counties, 69 are in the 10th (Kansas City) Federal Reserve District and eight in the 11th (Dallas) District. There are 182 banks under State supervision and 212 national banks. In 1939, 380 banks carried Federal Deposit Insurance and 14 did not. Bank deposits averaged \$445,396,000 during 1937. State expenditures for 1939-40 were estimated at \$100,000,000. There is (Jan. 1, 1940) no State ad valorem tax, the main source of revenue being a gasoline tax, a sales tax (2%), a production tax, and an income tax. The funded State debt stood at \$25,622,681 in July 1939. (Estimated debt, July, 1940, \$32,600,000.)

Agriculture, Manufactures, Mineral Production.—The chief agricultural commodities are wheat, cotton, corn, grain sorghums, and broom corn. The total value of agricultural products for 1939 was \$115,040,000 compared with \$110,312,000 in 1938 (a 4% increase). Wheat with a value of \$37,472,000 ranked first in 1939. The value of cotton and cotton seed was \$25,934,000. The 1939 season average prices of most crops was above that of 1938. The principal mineral products are petroleum, coal, lead and zinc, gypsum and asphalt. There is a known reserve of 3,500,000,000bbl. of petroleum and in 1939 there was a total production of 153,349,000bbl. of crude oil. In 1939, there were produced 1,062,212 tons of coal, 100,957 tons of lead and zinc, 98,264 tons of gypsum, and 51,254 tons of asphalt. The chief manufacturing interests are glass, cement, flour, brooms, bricks and all types of refinery products. The total value of manufactured products in 1935 was \$282,658,470. (R. GIT.)

Old Age Pension: see ELECTIONS; INITIATIVE AND REFERENDUM; LEGISLATION, FEDERAL; NEW ZEALAND, DOMINION OF; SOCIAL SECURITY. See also under various States.

Oliphant, Herman (1884-1939), U.S. fiscal expert, was born in Forest, Ind., on August 31. He took his bachelor's degree at Indiana university in 1909 and his doctorate of jurisprudence at the University of Chicago five years later. Meanwhile he was instructor of English at Marion college in Indiana. From 1914 to 1921 he taught law at the University of Chicago, and from 1921 to 1929 he was professor of law at Columbia university. In 1929 he helped organize the Institute of Law at Johns Hopkins university, where he assisted in the preparation of many notable surveys of judicial systems and litigation in the United States. Henry Morgenthau, Jr. invited him to Washington in 1933 to act as his legal counsel in the new Farm Credit Administration. After Morgenthau became Secretary of the Treasury on Jan. 1, 1934, he appointed Oliphant general counsel of the Department of the Treasury. This position he held until his death in Washington on January 11. Oliphant became widely known during Roosevelt's second administration as author of the ill-fated undistributed profits tax.

Olive Oil: see VEGETABLE OILS AND ANIMAL FATS.

Oman and Muscat: see ARABIA.

Ontario, one of the original provinces of the Dominion of Canada; area, 412,582 sq.mi.; population according to the Dominion census of 1931, 3,431,683, estimated Jan. 1,

1940, 3,731,000. Capital, Toronto, 631,207. Of the Province's population 2,095,992 are urban, or 61%; 2,794,631 native born or 81%.

Much attention has been directed to the policy of the Government of Ontario in supplying cheap light and power to the people of the Province through the publicly owned and controlled Hydro-Electric Power Commission. The Commission provides electric services to 782 municipalities, comprising nearly all of the cities and towns in the Province as well as many small communities and local areas. The actual distribution within a municipality is performed by the municipality itself, under the supervision of the Commission. The capital of the Commission and Municipal Utilities amounts to \$424,422,000. reserves \$184,016,209. Rates are low and the service is excellent. The net value of the total production of the Province in 1936 was \$1,183,844,782. an increase of 10% over the preceding year. The net annual agricultural revenue in 1936 was \$234,619,984; of mineral products for 1936, \$151,874,462. The net value of forest products was \$58,390,676; of manufactured products \$686,470,917.

The provincial election of 1937 resulted in the return to power of the Liberal Party under the leadership of the Hon. Mitchell Hepburn. The party standing of the Provincial Legislature comprises 63 Liberals, 23 Conservatives and 4 Independents. The lieutenant-governor is the Hon. Albert Matthews. Ontario is represented in the Dominion Parliament by 24 senators, appointed for life and 82 members of the House of Commons elected for a term of five years or less.

BIBLIOGRAPHY: *Annual Report of the Department of Labour; Statistical Year Book of Ontario; Annual Report of the Hydro-Electric Commission.* (J. C. He.)

Opera: see MUSIC.

Ophthalmology: see EYE, DISEASES OF.

Opium: see DRUGS AND DRUG TRAFFIC: *League of Nations.*

Orange Free State: see SOUTH AFRICA, THE UNION OF.

Oranges.

Bumper crops and a market disrupted by war were the lot in 1939 of the orange section of the citrus fruit industry, which, as a whole, has had the largest expansion of any branch of agriculture in the last 20 years. Exports of oranges from Spain for the season ending Oct. 31, 1939, were 2,572,000 half cases, compared to 3,243,000 half cases for the 1938 season. The five-year average (1933-37) was 10,479,000 half cases. Orange groves of Spain were less damaged "than would be supposed," official advices report. Orange exports from Egypt for the season ending March 31, 1939, were 729,000 boxes, compared to 341,000 boxes in the preceding season. The United States orange crop in 1939 was estimated by the Department of Agriculture as 78,564,000 boxes. In 1938, the record high, it was 78,863,000 boxes. The ten-year (1928-37) average was 53,785,000 boxes. The orange crop by States in 1939, in 1938 and for the ten-year (1928-37) average was as follows, in boxes:

	1939	1938	10-yr. average
California	30,080,000	41,152,000	34,715,000
Florida	35,000,000	33,000,000	17,842,000
Texas	2,732,000	2,815,000	677,000
Arizona	462,000	430,000	182,000
Louisiana	260,000	385,000	255,000
Alabama	75,000	96,000	78,000
Mississippi	59,000	85,000	39,000

For current data on the cost of marketing oranges see *Nation's Business* of July 1939, in which Robert W. Gordon quotes the California Fruit Growers Exchange average costs for marketing for five years, including five cents a box for advertising.

(S. O. R.)

Oregon.

Area, 96,699 sq.mi.; population: April 1, 1930 (census), 953,786; 1938 (Oregon Chamber of Commerce

estimate), 1,053,000. Portland, 1939 (Polk's Directory estimate), 337,183. Salem, the capital, 1939 (estimate), 31,816.

History.—The year 1939 saw Oregon looking to the future and visioning great strides in its industrial path. Chiefly, this was due to the completion of the giant Bonneville dam. The first big industry to be attracted by the lure of cheap power was the Aluminum Corporation of America, which is located on the Washington side of the Columbia river with its \$3,000,000 plant.

But the State of Oregon took this as a healthy sign of the industry to come.

Meanwhile, Oregon was talking public utility districts. In every section to which transmission from the Government's big Bonneville project was feasible, groups of citizens talked of forming public utility districts. Private power companies at the same time faced sale to the districts. In its Holland-like Willamette valley, the beginning of the \$62,000,000 irrigation and flood control project was awaited. Embodying six dams, the project will be a giant "tap" on the flow of Willamette river water and will open thousands of acres to new farms.

The year 1939 saw labour peace in Oregon. The so-called anti-picketing law went into effect. This prevents picketing where more than 50% of the employees are not involved. As the year ended the A.F. of L. was trying out an experiment—using a large "unfair" headline on its own publication and having the paper offered for sale in front of any establishment where there was difficulty. This was held to be the sale of a newspaper rather than picketing, despite the obvious intent of the displayed headline.

The State dedicated its new \$1,000,000 library building, adjoining the new \$2,500,000 capitol. Looking to the future, Salem residences are making way on surrounding blocks for a capitol group.

The legislature moved into the capitol in Jan. 1939, after a regular and a special session in the Salem armoury due to fire in 1935. The lawmakers did little, making minor changes in the income tax. Again they rejected all attempts at a sales tax, voted down repeatedly by the people of Oregon.

Education.—The census rolls show 270,396 children of school age (4 to 19), with 207,417 enrolled in public schools. Of these, 62,063 were in high schools. There were 7,887 teachers and administrators. There were 1,755 elementary schools, 264 standard high schools, 34 junior high schools, and the average teacher's salary was \$1,309.73, a gain of \$20.12 for 1938-39. The school debt stood at: bonds, \$14,627,954.83; warrants, \$1,258,957.79; other \$104,945.82; total, \$15,991,858.24.

Finances.—The condition of the State was increasingly favourable. The State bonded debt was reduced from \$50,586,810 in 1936 to \$38,718,085 on Oct. 1, 1939.

Manufactures.—A census showed that there were 2,107 manufactures in the State, employing 117,396 persons, paying \$157,357,520 in wages, and producing products of a value of \$363,142,053. Of this total, lumber products accounted for \$127,760,857; canned and dried fruits and vegetables, \$24,212,542; flour and grain mill products, \$19,138,231; paper, \$16,643,999. (P. H. P.)

Osteopathy.

Considerations of public health and welfare had a large place in osteopathic activities in 1939. It being a "legislative year," laws affecting the practice rights of osteopathic physicians, and their ability to serve their patients, were enacted or amended in Delaware, Florida, Maine, Montana, New York, Ohio, Oklahoma, South Dakota and Tennessee. California and Los Angeles were added to the list of important States and cities whose boards of health include osteopathic physicians. South Dakota and Tennessee forbade by law any infringement upon the rights of patients of osteopathic physicians in the admin-

Agriculture, Manufactures, Mineral Production.—Important crops, with provisional figures of production for 1939, are as follows: corn, 167,825,000bu.; soybeans, 7,854,000bu.; apples, 5,800,000bu.; tobacco, 28,160,000lb.; potatoes, 12,626,000bu.; wheat, 36,669,000bu.; oats, 35,490,000bu.; barley, 1,050,000bu.; tame hay, 3,487,000 tons. Corn in 1939 reached a record estimated yield of 49bu. per acre. Manufactures in 1937 were valued at \$5,099,816,893, with steel products, rubber tires, electrical machinery and motor vehicles leading. Total mineral output in 1937 was valued at \$131,025,104. Principal minerals were coal (\$44,313,000), clay products (\$24,329,083), natural gas (\$19,967,000), stone (\$9,426,808), coke (\$32,185,945), lime (\$8,653,571) and pig iron.

Oil: see PETROLEUM.

Oils and Fats, Vegetable and Animal: see VEGETABLE OILS AND ANIMAL FATS.

Oklahoma, the forty-sixth State of the United States, and popularly known as the "Sooner State," has a total area of 70,057 square miles. The population in 1930 was 2,396,040 (estimated July 1, 1937, as 2,548,000). The capital and largest city is Oklahoma City, population 185,389 (estimated, 1939, 225,000); the second largest city is Tulsa, 141,258 (estimated 160,000). Of the State's population, 821,681 were urban, or 31%; 2,095,671 were native white; 26,753, foreign-born white; 172,198, coloured; and 92,725, Indian.

History.—The year 1939 opened with the inauguration on January 9 of Leon C. Phillips as 11th governor. The 17th legislature remained loyal to the new governor and the session ended with little change in the way of taxation or increased appropriations. The heavy debt of the State has been constantly criticized by the governor and steps have been taken in an attempt to bring about a more economical State Government. In August the State forced all oil production to cease and for two weeks all State wells were shut down. The situation came as a result of similar action taken in Texas and was widely heralded as a price-fixing scheme. However, State officials stoutly maintain that production exceeded the market demand and that the purpose was conservation as State statutes define any production of oil over market demand as waste.

On the educational scene, strife appeared between the governor and the State department of education over issuance of the \$11,000,000 common school fund. In addition, control of the State teachers colleges was wrested from the State board of education and placed in the hands of a college board of regents. As a result of laws passed by the 17th legislature the so-called teachers colleges were changed to State colleges and in many instances changes were made in the administration of the schools. At present, the governor has the power to approve all institutional budgets by the quarter and to make any recommendations he feels are necessary for the economic stability of the State.

Education.—The educational institutions include the University of Oklahoma, Norman; Oklahoma Agricultural and Mechanical college, Stillwater; Panhandle Agricultural and Mechanical college, Goodwell; Oklahoma College for Women, Chickasha; Colored Agricultural and Normal university, Langston; six State colleges, formerly teachers colleges; four secondary agricultural schools; three junior colleges; with six independent senior colleges, and three independent junior colleges. There are 19 municipal junior colleges and 868 approved high schools. Elementary and high school district average daily attendance, 1939, was 497,120.

Charities and Corrections.—The hospital and eleemosynary institutions include three white mental hospitals located at Norman, Vinita and Supply; two tubercular hospitals at Clinton and

Talihina; two orphan homes at Helena and Whitaker; school for the deaf, Sulphur; school for the blind, Muskogee; Deaf, Blind, and Orphans' Home for Coloured Children, Taft; and the State Hospital for Negro Insane, Taft. The penal and corrective institutions include the State penitentiary at McAlester; Oklahoma State reformatory, Granite; Training School for White Boys, Pauls Valley; State Industrial School for White Girls, Tecumseh; and training schools for Negro boys at Boley and for Negro girls at Taft.

Banking and Finance.—Of the 77 counties, 69 are in the 10th (Kansas City) Federal Reserve District and eight in the 11th (Dallas) District. There are 182 banks under State supervision and 212 national banks. In 1939, 380 banks carried Federal Deposit Insurance and 14 did not. Bank deposits averaged \$445,396,000 during 1937. State expenditures for 1939-40 were estimated at \$100,000,000. There is (Jan. 1, 1940) no State ad valorem tax, the main source of revenue being a gasoline tax, a sales tax (2%), a production tax, and an income tax. The funded State debt stood at \$25,622,681 in July 1939. (Estimated debt, July, 1940, \$32,600,000.)

Agriculture, Manufactures, Mineral Production.—The chief agricultural commodities are wheat, cotton, corn, grain sorghums, and broom corn. The total value of agricultural products for 1939 was \$115,040,000 compared with \$110,312,000 in 1938 (a 4% increase). Wheat with a value of \$37,472,000 ranked first in 1939. The value of cotton and cotton seed was \$25,934,000. The 1939 season average prices of most crops was above that of 1938. The principal mineral products are petroleum, coal, lead and zinc, gypsum and asphalt. There is a known reserve of 3,500,000,000bbl. of petroleum and in 1939 there was a total production of 153,349,000bbl. of crude oil. In 1939, there were produced 1,062,212 tons of coal, 100,957 tons of lead and zinc, 98,264 tons of gypsum, and 51,254 tons of asphalt. The chief manufacturing interests are glass, cement, flour, brooms, bricks and all types of refinery products. The total value of manufactured products in 1935 was \$282,658,470. (R. GIT.)

Old Age Pension: see ELECTIONS; INITIATIVE AND REFERENDUM; LEGISLATION, FEDERAL; NEW ZEALAND, DOMINION OF; SOCIAL SECURITY. See also under various States.

Oliphant, Herman (1884-1939), U.S. fiscal expert, was born in Forest, Ind., on August 31. He took his bachelor's degree at Indiana university in 1909 and his doctorate of jurisprudence at the University of Chicago five years later. Meanwhile he was instructor of English at Marion college in Indiana. From 1914 to 1921 he taught law at the University of Chicago, and from 1921 to 1929 he was professor of law at Columbia university. In 1929 he helped organize the Institute of Law at Johns Hopkins university, where he assisted in the preparation of many notable surveys of judicial systems and litigation in the United States. Henry Morgenthau, Jr. invited him to Washington in 1933 to act as his legal counsel in the new Farm Credit Administration. After Morgenthau became Secretary of the Treasury on Jan. 1, 1934, he appointed Oliphant general counsel of the Department of the Treasury. This position he held until his death in Washington on January 11. Oliphant became widely known during Roosevelt's second administration as author of the ill-fated undistributed profits tax.

Olive Oil: see VEGETABLE OILS AND ANIMAL FATS.

Oman and Muscat: see ARABIA.

Ontario, one of the original provinces of the Dominion of Canada; area, 412,582 sq.mi.; population according to the Dominion census of 1931, 3,431,683, estimated Jan. 1,

1940, 3,731,000. Capital, Toronto, 631,207. Of the Province's population 2,095,992 are urban, or 61%; 2,794,631 native born or 81%.

Much attention has been directed to the policy of the Government of Ontario in supplying cheap light and power to the people of the Province through the publicly owned and controlled Hydro-Electric Power Commission. The Commission provides electric services to 782 municipalities, comprising nearly all of the cities and towns in the Province as well as many small communities and local areas. The actual distribution within a municipality is performed by the municipality itself, under the supervision of the Commission. The capital of the Commission and Municipal Utilities amounts to \$424,422,000. reserves \$184,016,209. Rates are low and the service is excellent. The net value of the total production of the Province in 1936 was \$1,183,844,782. an increase of 10% over the preceding year. The net annual agricultural revenue in 1936 was \$234,619,984; of mineral products for 1936, \$151,874,462. The net value of forest products was \$58,390,676; of manufactured products \$686,470,917.

The provincial election of 1937 resulted in the return to power of the Liberal Party under the leadership of the Hon. Mitchell Hepburn. The party standing of the Provincial Legislature comprises 63 Liberals, 23 Conservatives and 4 Independents. The lieutenant-governor is the Hon. Albert Matthews. Ontario is represented in the Dominion Parliament by 24 senators, appointed for life and 82 members of the House of Commons elected for a term of five years or less.

BIBLIOGRAPHY: *Annual Report of the Department of Labour; Statistical Year Book of Ontario; Annual Report of the Hydro-Electric Commission.* (J. C. HE.)

Opera: see MUSIC.

Ophthalmology: see EYE, DISEASES OF.

Opium: see DRUGS AND DRUG TRAFFIC: *League of Nations.*

Orange Free State: see SOUTH AFRICA, THE UNION OF.

Oranges. Bumper crops and a market disrupted by war were the lot in 1939 of the orange section of the citrus fruit industry, which, as a whole, has had the largest expansion of any branch of agriculture in the last 20 years. Exports of oranges from Spain for the season ending Oct. 31, 1939, were 2,572,000 half cases, compared to 3,243,000 half cases for the 1938 season. The five-year average (1933-37) was 10,479,000 half cases. Orange groves of Spain were less damaged "than would be supposed," official advices report. Orange exports from Egypt for the season ending March 31, 1939, were 729,000 boxes, compared to 341,000 boxes in the preceding season. The United States orange crop in 1939 was estimated by the Department of Agriculture as 78,564,000 boxes. In 1938, the record high, it was 78,863,000 boxes. The ten-year (1928-37) average was 53,785,000 boxes. The orange crop by States in 1939, in 1938 and for the ten-year (1928-37) average was as follows, in boxes:

	1939	1938	10-yr. average
California	30,050,000	41,152,000	34,715,000
Florida	35,920,000	33,920,000	17,842,000
Texas	2,730,000	2,815,000	677,000
Arizona	400,000	430,000	180,000
Louisiana	200,000	385,000	255,000
Alabama	75,000	90,000	78,000
Mississippi	59,000	85,000	39,000

For current data on the cost of marketing oranges see *Nation's Business* of July 1939, in which Robert W. Gordon quotes the California Fruit Growers Exchange average costs for marketing for five years, including five cents a box for advertising.

(S. O. R.)

Oregon. Area, 96,699 sq.mi.; population: April 1, 1930 (census), 953,786; 1938 (Oregon Chamber of Commerce

estimate), 1,053,000. Portland, 1939 (Polk's Directory estimate), 337,183. Salem, the capital, 1939 (estimate), 31,816.

History.—The year 1939 saw Oregon looking to the future and visioning great strides in its industrial path. Chiefly, this was due to the completion of the giant Bonneville dam. The first big industry to be attracted by the lure of cheap power was the Aluminum Corporation of America, which is located on the Washington side of the Columbia river with its \$3,000,000 plant.

But the State of Oregon took this as a healthy sign of the industry to come.

Meanwhile, Oregon was talking public utility districts. In every section to which transmission from the Government's big Bonneville project was feasible, groups of citizens talked of forming public utility districts. Private power companies at the same time faced sale to the districts. In its Holland-like Willamette valley, the beginning of the \$62,000,000 irrigation and flood control project was awaited. Embodying six dams, the project will be a giant "tap" on the flow of Willamette river water and will open thousands of acres to new farms.

The year 1939 saw labour peace in Oregon. The so-called anti-picketing law went into effect. This prevents picketing where more than 50% of the employees are not involved. As the year ended the A.F. of L. was trying out an experiment—using a large "unfair" headline on its own publication and having the paper offered for sale in front of any establishment where there was difficulty. This was held to be the sale of a newspaper rather than picketing, despite the obvious intent of the displayed headline.

The State dedicated its new \$1,000,000 library building, adjoining the new \$2,500,000 capitol. Looking to the future, Salem residences are making way on surrounding blocks for a capitol group.

The legislature moved into the capitol in Jan. 1939, after a regular and a special session in the Salem armoury due to fire in 1935. The lawmakers did little, making minor changes in the income tax. Again they rejected all attempts at a sales tax, voted down repeatedly by the people of Oregon.

Education.—The census rolls show 270,396 children of school age (4 to 19), with 207,417 enrolled in public schools. Of these, 62,063 were in high schools. There were 7,887 teachers and administrators. There were 1,755 elementary schools, 264 standard high schools, 34 junior high schools, and the average teacher's salary was \$1,309.73, a gain of \$20.12 for 1938-39. The school debt stood at: bonds, \$14,627,954.83; warrants, \$1,258,957.79; other \$104,945.82; total, \$15,991,858.24.

Finances.—The condition of the State was increasingly favourable. The State bonded debt was reduced from \$50,586,810 in 1936 to \$38,718,085 on Oct. 1, 1939.

Manufactures.—A census showed that there were 2,107 manufactures in the State, employing 117,396 persons, paying \$157,357,520 in wages, and producing products of a value of \$363,142,053. Of this total, lumber products accounted for \$127,760,857; canned and dried fruits and vegetables, \$24,212,542; flour and grain mill products, \$19,138,231; paper, \$16,643,999. (P. H. P.)

Osteopathy. Considerations of public health and welfare had a large place in osteopathic activities in 1939. It being a "legislative year," laws affecting the practice rights of osteopathic physicians, and their ability to serve their patients, were enacted or amended in Delaware, Florida, Maine, Montana, New York, Ohio, Oklahoma, South Dakota and Tennessee. California and Los Angeles were added to the list of important States and cities whose boards of health include osteopathic physicians. South Dakota and Tennessee forbade by law any infringement upon the rights of patients of osteopathic physicians in the admin-

istration of public health programs, and Ohio made it unlawful for non-profit hospital service plans to discriminate against them. Rights of the people to select physicians properly accredited and licensed by the States, without regard to their school of practice, were protected also in numerous laws and regulations having to do with such public health problems as pre-marital examinations, examinations of expectant mothers, etc.

In preparing better to serve the public the American Osteopathic Association completed the organization of an advisory board for the certification of specialists, and advance steps were taken by the Associated Colleges of Osteopathy, the American Osteopathic Hospital Association and the National Board of Examiners for Osteopathic Physicians and Surgeons. Osteopathic colleges improved their facilities for giving postgraduate work, and the number of osteopathic hospitals training interns was increased.

In its public health educational efforts, osteopathy extended greatly its radio and other informational enterprises. The American Osteopathic Association was officially represented before the U.S. Senate committee studying the bill to set up a national health program (the so-called Wagner Health bill), continued its participation in the National Council for Mothers and Babies and was represented in the White House Conference on Children in a Democracy. The 1939 convention of the American Osteopathic Association was held in Dallas, Texas. (R. G. HU.)

Ottawa, the capital of the Dominion of Canada and the seat of the Supreme Court, is situated on the right bank of the Ottawa river near the mouth of the Rideau, both rivers having very beautiful falls. The city itself is divided into an upper and a lower town by the Rideau canal. The Parliament buildings are situated on a series of high bluffs which overlook the river, in one direction toward the Chaudière falls and in the opposite direction toward the Rideau falls. The population of the city is 126,872; of the metropolitan district (including Hull) 175,988. The gross value of manufactured products in 1939 was \$25,043,818. Its most important educational institution is the Université d'Ottawa.

BIBLIOGRAPHY.—*Handbook of the City of Ottawa; The Canada Year Book.* (J. C. HE.)

Outer Mongolia: see MONGOLIA.

Oxford University. Gifts of £23,000 and £6,000 from the Rockefeller Foundation and Imperial

Chemical Industries respectively were made for the erection of a new wing to the organic chemistry laboratory and for the purchase of special apparatus and equipment for it. Gifts of £550 a year for seven years from Harry Sacher and of £500 a year for five years from Manchester college have made it possible to establish readerships in post-Biblical Jewish studies and in religious education.

The number of matriculations in the academic year 1938-39 was 1,717, which is 101 more than in the previous year. The number of research students increased by 12 to 459; 1,135 persons took the

B.A. degree; 552 the M.A., and the total number of persons taking all other degrees was 243.

The total expenditure of the university (exclusive of the colleges) in 1937-38 was £527,548.

T. F. Higham succeeded Dr. Cyril Bailey as Public Orator.

In accordance with arrangements settled between the university, H.M. Government and other bodies in the course of the year, many university and college buildings were made available for public purposes on the outbreak of the European war. The university also, by arrangement with the military authorities and the Ministry of Labour, provided accommodation and staff for the board which selected volunteers from among the younger members of the university for certain branches of national service. The board dealt with 2,362 offers of service.

BIBLIOGRAPHY.—*The Oxford University Handbook; The Oxford University Gazette* (especially for Oct. 13, 1939 containing the Vice-Chancellor's Review of the Year); *The Annual Report of the University; Oxford* (the Magazine of the Oxford Society). (D. V.)

Pacific Islands, British. Territories of the British Empire in the Pacific ocean, of which certain essential statistics are given in the table below. See **BRITISH EMPIRE** for population, capital towns, status, and governments.

History.—The most important of these are the Fiji islands; the British Western Pacific islands, comprising the colony of the Gilbert and Ellice islands and the Solomon islands and Tongan islands protectorates; the New Hebrides, under joint British and French administration; and the Australian territory of Papua.

Fiji suffered severe floods in January. The new Government buildings were opened on May 12. A significant step, for good or ill, was the transference to the Government of the Suva Municipal Council.

A severe earthquake on April 30, followed by a tidal wave, caused considerable damage and some deaths in the Solomon islands. A 50-year agreement was signed with the U.S.A. for joint occupation of Canton and Enderbury, islands in the Phoenix group of the Gilbert and Ellice islands colony.

In Papua, a territory in the north, explored in 1935 but hitherto a prohibited area, was declared open. Disappointment was caused by the abandonment of operations by Papua Oil Development Limited.

The commission set up by the Australian Government reported against a proposal for uniting the mandated territory of New Guinea with Papua.

Territory and Area Square Miles	Principal Products exported 1938 (in tons)	Imports and Exports 1938 (in thousand £)	Revenue and Expenditure 1938 (in thousand £)	Education: Elementary and Secondary 1937
FIJI 7,055	sugar (total) 131,344 copra (total) 33,475	imp. £ Fiji 1,675 exp. £ Fiji 2,535	rev. £ Fiji 890 exp. £ Fiji 967	(1938) schls., 253; schlrs. 29,323 (1,622 Eurpn., 19,580 Fiji, 7,968 Ind., 153 Chinese)
PAPUA (administered by the Commonwealth of Australia; see also PACIFIC ISLANDS, MANDATED) 87,786 (mainland) 2,754 (islands)	(1937-38 export) rubber £129,448 gold £108,141	(1937-38) imp. 631 exp. 436	(1937-38) rev. £A 183 exp. £A 183	..
GILBERT AND ELLICE ISLANDS COLONY (including the Gilbert group; the Ellice group; Ocean island [seat of administration]; Fanning, Washington and Christmas islands; and the Phoenix group*). c. 200	phosphate of lime 329,800 copra 4,850	(1937-38) imp. 207 exp. 351	(est. 1938-39) rev. 80.6 exp. 84.6	schls., 224; schlrs., 6,728
NEW HEBRIDES (a condominium administered jointly by the British and French Governments) 5,700	copra 11,448 cocoa 1,893	imp. 112 exp. 120	rev. 27.6 exp. 23.9	Numerous Presbyterian and Catholic mission native schls., 1 Fr. Govt. schl., and 1 Catholic mission schl. for whites
BRITISH SOLOMON ISLANDS PROTECTORATE, 11,458	copra 22,937	(1937-38) imp. 233 exp. 292	(est. 1938-39) rev. 69.5 exp. 69.3	elem. schls., 6; schlrs., 4,889
TONGAN ISLANDS PROTECTORATE. c. 250	copra 12,427 bananas, 70,825 cases	imp. 82.8 exp. 98.4	(est. 1938-39) rev. 64.4 exp. 73.8	schls., 108; schlrs., 6,128

*Canton and Enderbury islands, in the Phoenix group, are shared with the U.S.A. under the Anglo-American pact, Aug. 10, 1938.

Pacific Islands, French. The latest available statistics for this French colony are given herewith: area (Society, Tuamotu, Tubai and Marquesas Is.), 1,540 sq.mi.; pop. (est. Dec. 31, 1937) 45,000 (whites, c. 3,700). Chief town: Papeete (in Tahiti), cap., 8,460. Governor: M. Chastenet de Gurry.

Finance 1939: local budget (est.) 27,560,000 francs.

Overseas Trade 1938: imports 63,241,000 francs; exports 47,647,000 francs. Roads 1937: Tahiti 48mi.; Raiatea 19mi.; shipping (1938) cleared, 162,927 net tons.

Production 1938: copra 25,000 francs; vanilla 12,000 francs; natural phosphates (1937) 147,000 metric tons.

Pacific Islands, Mandated. The former German possessions in the Western Pacific comprise part of New Guinea with adjacent archipelagos, Western Samoa, the Marshall, Caroline, Palau and Ladrone or Marianne islands, and the islet of Nauru. Certain essential statistics of these territories are given in the following table. For capital towns and governors of New Guinea, Western Samoa and Nauru, see also BRITISH EMPIRE.

Territory and Area Square Miles	Population and Status	Principal Products	Imports and Exports (ooo's omitted)	Revenue and Expenditure (ooo's omitted)
NEW GUINEA, mandated territory (69,700) including Bismarck Archipelago (19,200) and Solomon Is. (4,100)	304,445 (white, 4,445) Under Mandate of the Common- wealth of Australia	(1937-38) gold £2,028,980; copra £847,734	(1937-38) imp. £1,611 exp. £2,980	(1937-38) rev. £A506 exp. £A509
WESTERN SAMOA	59,306 (white, 412) Under Mandate of New Zealand	(Export 1938) copra 11,241 tons; ba- nanas 7,347	(1938) imp. £106 exp. £249	(1938-39) rev. £124 exp. £119
MARIANNE IS., CAROLINE IS., PALAU, and MARSHALL IS. (811)	107,137 (Japanese, 56,496) Under Japanese Mandate	(1936) cane sugar 49,100 net tons; phosphates 84,973 net tons	(1936) imp. 13,866 yen exp. 25,108 yen	(1936) rev. 9,904 yen exp. 9,675 yen
NAURU (8)	3,385 (European 187, Chi- nese 1,516) Under British Mandate, held jointly by Great Britain, Australia, and New Zealand	(1938) natural phosphates 841,050 tons	(1938) imp. £A272 exp. £A547	(1938) rev. £A29.4 exp. £A30.3

Pacifism. Pacifism is a system of beliefs in the desirability and possibility of permanent peace. This belief may be based on liberal-humanitarian, rational-cosmopolitan or religious grounds. It always presupposes a belief in the essential unity of mankind and in the sanctity and dignity of individual existence. It is thus completely opposed to fascism which denies the oneness of mankind and the dignity of the individual and which believes that permanent peace is neither possible nor desirable because war alone awakens, according to fascism, the highest moral response in man. The communist attitude which rejects only certain wars which they label as "imperialist" or "capitalistic" wars, cannot be regarded as pacifist, even less the isolationist attitude which is based upon the sole consideration of national self-interest, and does not reject war in principle, but only if it does not involve their own nation's honour, security or wants.

A twofold attitude can be involved in pacifism. The one is the so-called "absolutist" pacifism as best represented by the conscientious objectors and by the War Resisters International which has its centre in England and branches in most democratic countries. They reject war under any circumstances and refuse to participate in it. With the outbreak of the European war in Sept. 1939 the British Government took this point of view into consideration and recognized it officially. Special tribunals were instituted before which conscientious objectors were to appear and to prove their sincerity which was generally presupposed in all men who had belonged to religious organizations taking the absolutist pacifist point of view like the Society of Friends. These tribunals either absolved the conscientious objectors from all military service or assigned them to non-combatant service.

Generally the European war of 1939 brought in Great Britain

and Canada no restriction upon any form of propaganda for absolutist pacifism.

Another pacifist attitude believes that the only promising approach towards the establishment of a secure international peace can be through establishing international law on a firm foundation so that disputes between nations be judged judicially as are disputes between other groups. This pacifism regards isolationism in the present war as one of the fundamental obstacles to the establishment of peace which can be reached only by concerted peace efforts of all peace-loving nations. It believes that no nation can live its own life in peace in a world of lawlessness and anarchy, and therefore it affirms the necessity for all nations to co-operate in finding ways and means to organize the international community for concerted action to oppose aggression. The ultimate aim of this pacifism is the establishment of a world organization which would not only secure peace, but also replace military rivalries by economic and cultural co-operation between the nations. The outbreak of the European war in 1939 resulted in the establishment of an International Peace Campaign with national committees in the United States, Great Britain, the British Dominions and France. This Campaign discussed the

foundations upon which the peace at the end of the European war should be based so as to achieve the aims of pacifism. This peace should establish a system of collective security which would make possible a settlement of international differences without resort to war, allow the immediate beginning of general disarmament and lay the foundations of justice and liberty for all peoples. There is no doubt that this war, with

its threat of spreading and drawing "neutral" nations into its maelstrom, has acted as a great stimulus to pacifism, as the only alternative to the establishment of a system of collective security seems to be the rapid increase in the burden of armaments and the growth of international chaos with its repercussions for all, even the most distant nations. A project much discussed during 1939 was the proposed federation of democracies, suggested by Clarence Streit, an American journalist, in his book *Union Now*. This proposal found wide response, especially in Great Britain. British and French statesmen have repeatedly declared that they envisaged as the outcome of the European war the creation of some form of federation or rejuvenated League of Nations to establish lasting peace. (See also INTERNATIONAL LAW; RELIGION.)

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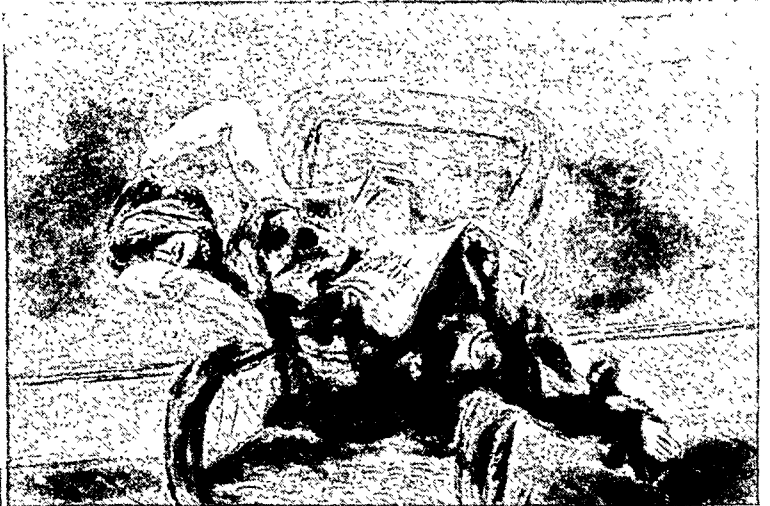
Packaged Fuel: see FUEL BRIQUETTES.

Painting. **United States.**—In American painting during the year 1939 two important turns of interest were evident. On one hand regionalist and "American Scene" emphases in subject matter notably diminished; and on the other, themes of social satire and political propaganda narrowed in popularity. Both these developments probably grew out of a fundamental dissatisfaction with the results that these approaches were producing. The Contemporary American Art Exhibition at the New York World's Fair, so carefully planned to bring to light anything of real interest in the way of regional expression, proved a distinct failure in this direction. Nothing with an unexpected tang was discovered.

"GEORGIA JUNGLE" by Alexander Brook of New York (1898—) won first prize at the 1939 Carnegie International exhibition in Pittsburgh



YASUO KUNIYOSHI (1893—), Japanese-born American artist, won second prize at the 1939 Carnegie International exhibition in Pittsburgh with his "Lay Figure—1938"



MURAL for the Department of Interior building, Washington, D.C., by William Gropper, entitled "Construction of the Dam," installed May 7, 1939



ONE OF EDGAR BRITTON'S two murals, "The Story of Petroleum," completed in Aug. 1939, for the Department of Interior building, Washington, D.C.

And once the novelty of political and class-conscious expressions had worn thin, the narrow and shoddy repertory of pictorial conventions upon which they were hung began to show through. It was clear that the essentials of pictorial expression had been neglected in these emphases on the associational interests in subject matter. Finally, the signing of the pact between Berlin and Moscow left political propagandists in an embarrassing quandary; while the major scale of the threatened tragedy abroad made such daintily patriotic whimsies as the Iowan Grant Wood's 1939 version of *George Washington and the cherry tree legend*, "Parson Weem's Fable," seem pathetically jejune.

During 1939 the serious curtailment of the WPA Arts Project patronage was in part offset by commissions to mural painters and sculptors by the New York World's Fair and the Golden Gate Exposition; while in Washington the section of fine arts of the Public Buildings Administration, under the directorship of Edward Bruce, held the largest competition since the inauguration of this system in 1934. One thousand four hundred and seventy designs were submitted anonymously; out of these 48 were chosen for execution. Yet neither this competition nor the opportunities provided by the extensive Fair commissions brought to light any striking new direction or talent. Even at the New York Fair the most satisfactory mural was the decoration of the inner court of the Old Masters Building by the repatriated, experienced Lyonel Feininger.

Of the older generation, however, it was John Marin who primarily distinguished himself during the year for his bold and imaginative exploration of the medium of oil-paint which he had taken up only in the last few years. On the other hand, his water-colour expressions suffered no neglect and preserved all their personalized spontaneity and freshness. At the same time, the younger water-colourist, Charles Burchfield, who had been painting relatively sombre oils during the last few years, seemed to throw a backward glance to his fanciful water-colours of 1917 and 1918 and from them recover a new lyricism for his 1939 work; while George Grosz, also well known for his work in the water-colour medium and in biting social caricature, turned with a quiet but intense enthusiasm toward still-life and the depiction of texture contrasts in oils. Yasuo Kuniyoshi's first exhibition in three years showed him likewise placing an emphasis on textural effects. While his work was primarily a display of technical virtuosity it took rather the character of a distillation of effects than a development or change of direction. Like Kuniyoshi, Franklin Watkins in his 1939 work also leaned toward a primary interest in technical refinements. But in contrast to both these painters, Arthur Dove in his exhibition at "An American Place" returned to his early college interests with a fresh lyric note, while Marsden Hartley turned from his usual landscapes to a rough, burly figure-depiction; and William Gropper, in his Paul Bunyan series, laid primary stress on the energy of his brushwork. a richness of colour and deepening of plastic effects.

Europe.—The year 1939 will stand as a vital date in the history of European art. Not so much for what was produced in that year, but because it marked the close of a period. How long the present hostilities may last will not change the situation. The aesthetic outlook of Europe between the years 1919 and 1939 is permanently consigned to history. Should even the first months of 1940 see a withdrawal of troops from the field and a new economic peace there could be no return to the *status quo*; so many artists, philosophers, historians and teachers have been transplanted from Europe that a new peace-time must belong to a new generation. Already in 1939 the United States had begun to show the effects of these wholesale exportations of trained minds in a relaxation of regionalist prejudices against foreign influences; while Europe's discouragement and uncertainty of the future were evident in its relative unproductiveness in the fields of painting and sculpture.

Germany, controlling (Jan. 1, 1940) the greater part of middle Europe, dictated the art attitudes of that region as well as its political allegiance. The hostility of the Reich persevered toward all forms of the unconventional or even the unfamiliar in painting and sculpture which it had condemned publicly as "degenerate art." In fact the Government took an even bolder stand in the spring and summer of 1939 and offered many of the more valuable examples of late 19th and early 20th century foreign painting from

its museums for sale, both privately and at a public auction held in Switzerland. At the same time the officially approved art continued along the line of banal academicism.

Czecho-Slovakia, like Austria, after its absorption into the Reich gave over completely its earlier artistic individuality. Prague, previous to the Munich agreement had been one of the leading centres of modern art in Europe. But immediately following the Munich concordat all non-national tendencies in art were officially discouraged—particularly those that had been influenced by German expressionism or any of the various movements of Paris during the last half-century. The new prime minister, Beran, declared: "We must put an end to the modern scribble and smear artists and the jazz cries of modern art. We must return to our own Czech art and keep away from non-national tendencies." Many of the most prominent state art and museum officials were relieved of their positions primarily because of liberal sympathies. Notable among them was Vincenc Kramar, the director of the State Gallery of Old Art in Prague, a man of wide culture and scholarship who owned one of the richest collections of Cubist paintings in Europe, and whose book *Kubismus* (1921) was one of the earliest to be devoted entirely to Picasso in any language. Czech caricature, which boasted some of the most brilliant satirical draughtsmen in Europe was completely crippled. Thanks to the new censorship the drawings and montages of such men as Pelc and Hofmeister could no longer be published. While the painters Hartfield and Kokoschka, both closely identified with Prague during the last few years, left the country shortly after its assimilation by the Reich.

Italy, for all her totalitarian colour, had never taken the attitude to the arts that Germany and Russia had. Undoubtedly the senatorial rank of Marinetti, the founder of Italian Futurism in 1909, and Mussolini's early link with the literary members of that movement have played their part in the liberal official attitude of Fascist Italy. It is true that the recent work of Giorgio di Chirico, Fontana, Funi and others of their immediate group can scarcely be regarded as strikingly venturesome, leaning, as it does, toward a broad humanism. Nevertheless, the painting of such abstract artists as Alberto Magnelli, Pompeo Bona and Mauro Reggiani is also exhibited and encouraged. And in 1939 Magnelli clearly showed himself competent to stand up with the leaders of extreme abstract expression in their exhibitions in Paris. Furthermore, there has been no prejudice against displaying work of foreign surrealists in Italy nor against the acceptance of their influence by such young surrealist-abstractionists as Adone Asinari, Corrado Forlin and Gelindo Furlan.

Spain, in spite of the cessation of civil strife, was still, in 1939, most effectively represented in painting and sculpture by artists working outside its frontiers. Pablo Picasso in Paris had turned to large colourful portraits based on a pictorial symbolization of muscular and psychological responses to the subjects rather than the conventional visual approach. The result, in his most successful essays, was a new vitality of rhythmic organization well in accord with his natural linear predilections and a powerful gamut of non-naturalistic colour-contrasts. Joan Miró, in Paris also, found a new freshness in his 1939 work after his larger, more restrained compositions of 1937 and 1938. But while Picasso's new strength came from an increased tempo of development along lines which he had been following for some time, Miró's freshened note was struck by a return to earlier whimsical fantasies. For in his recent work Miró has completely abandoned the trend toward expressionistic realism which his large 1937 still-life "A Pair of Shoes" had seemed to inaugurate, for a lighter and gayer lyricism closer in spirit to his work of the pre-revolution period. At the same time the arch-surrealist, Salvador Dalí, continued to flout the conventions of the conservative art public, both in Paris and New York with consummate success. Still, in his large exhibition held in New York in the spring of 1939 there was a notable relaxation of the technical finesse which had so consistently characterized Dalí's earlier work. And here, for the first time, certain political references were allowed to creep in with the obvious purpose of bribing popular sympathy.

France, although relatively removed from the actual centres of trouble during the first six months of the year, seemed also to feel the threatening shadow. Shortly after the September crisis of 1938 Piet Mondrian, the Dutch neo-plastician, joined the constructivist sculptor Nahum Gabo in London. Antoine Pevsner, the brother of Gabo, continued his work with Domela in Paris; and all four collaborated in the comprehensive international exhibition of abstract art organized in the early summer by Pétró Van Doesberg, the widow of the founder of the Dutch Die Stijl movement. Henri Matisse, after finishing an important mural decoration for the apartment of Nelson Rockefeller in New York continued to work out extremely fresh decorative compositions with a new two-dimensional emphasis and a spontaneity of draughtsmanship that recalled his style previous to 1919 and particularly his early graphic work. The first two months of the year saw Fernand Léger in New York where he painted several decorations for the Rockefeller apartment and a sketch for a mural at the World's Fair. After his return to France and the outbreak of the war he withdrew to his native Normandy and set about a series of figure compositions, twice life size. Braque and Derain continued to work on large canvases more or less along the lines of their recent work; while the autumn months saw many of the younger men mobilized—the painter Jean Hélion even coming back from an extended sojourn in the United States to join the ranks. Early in 1939 the 77-year-old sculptor Aristide Maillol completed his monument "L'Air" for the city of Toulouse. And in the spring the former Cubist, Henri Laurens, held a notable one-man exhibition of sculpture in Paris in which works such as his "Amphion" showed a profound revitalization of expression.

Belgium, in June saw James Ensor, the dean of its impressionists, paid the honour of a large one-man exhibit in Paris. Earlier in the year the younger expressionist painter, Constant Permeke opened an exhibition of sculpture at the Palais des Beaux Arts in Brussels which placed him, in the opinion of the leading critics, with Constantin Meunier and Rik Wouters as one of the three greatest sculptors of Flanders in modern times. All three had been painter-sculptors, or perhaps better, sculptor-painters—each representative of a particular idiom; naturalism, impressionism, and expressionism. Permeke only took up sculpture at the age of 52.

Still it is not quite exact to state that this is an entirely new vein of expression for him. In reality in his sculpture he pursues the basic idiom of Permeke the painter—gigantic elementary nudes. Constant Permeke's expressionism is profoundly Flemish—a colossal and imperious monumentality. So in spite of his brusque change of métier, he kept integrally in his sculpture all the qualities, as well as the weaknesses and faults, of his painting. Among the young Belgians, Paul Delvaux and René Magritte, both surrealists, continued to do the most interesting easel paintings during 1939; while Auguste Mambour's large fresco in the Lycée Léonie de Waha in Liège in its originality and architectural suitability is easily the finest mural decoration produced in Belgium for many years.

England has never been a notable contributor to the plastic experimentation which has marked European painting in the 20th century. Still, in the last few years, there has been a growing audacity and receptivity to extra-territorial influences on the part of young English artists. And, in 1939, while well known names such as Walter Sickert, Duncan Grant, Matthew Smith, Vanessa Bell, Mark Gertler and Stanley Spencer are still widely represented by work and exhibitions, new names begin to take a front rank of interest if not of achievement. Among the younger men John Piper probably made the most notable advance in 1939. His landscapes show at once the benefits of his research in collage and in compositions of abstract forms. They offer an extremely personalized idiom and a free lyric sensibility to nature that gives his work a genuine distinction. Allied to Piper in his predominantly plastic interests are the two older men, Paul Nash the painter and the sculptor Henry Moore. Nash's response to the fantastic in nature brings him close to the surrealist fold, yet never tempts him to lose his English eye for the objective world about him; on the other hand Moore keeps one foot in the field of surrealism and the other in the camp of the abstract artists with such success that his latest productions make him probably the most interesting plastic artist in England today. During 1939 Ben Nicholson, the leader of extreme abstractionists, gave his earlier white geometrical reliefs a wide range of contrasting flat colours, but made no concessions to naturalistic representation. And sympathy with the abstract approach continued to show itself in the work of such men as Jackson, Stephenson and Hayter, even penetrating the London group in the work of John Tunnard, Roy de Maistre, Ceri Richards and others, in a less absolute form leaning rather toward surrealism. Among the avowed English surrealists the most striking newcomer of 1939 was the sculptor F. E. McWilliams; while the painter, John Armstrong in "his practical exploitation of ruins" or in a canvas such as his "River of the Dead" frankly ties a thread of the English romantic tradition into the warp of surrealist approach. (J. J. Sw.)

Paints and Varnishes.

United States production figures for the early months of 1939 showed a recovery from the slump of 1938, and a generally improved condition which promised well for the later months and for 1940. There has been a substantial change in paints and enamels toward balanced formulation, resulting in easier application, improved coverage, gloss and colour retention and increased life.

The developments in white pigments mentioned more particularly in connection with titanium oxide and zinc sulphide have resulted from study of the physical as well as the chemical characteristics. The literature carries numerous articles on X-ray studies of the crystal structure and infra-red studies of the particle size and distribution of pigments which point definitely to an even more nearly complete technical control of the protective coating industry.

The work of Dr. Kathryn Blodgett in the elimination of reflection from glass surfaces by the use of thin films of organic coating material may lead to interesting developments in the paint field. Illuminating engineers are awaiting with decided interest the commercial exploitation of recent developments in wall coating which absorb radiant infra-red rays and, consequently, give promise of enabling the illuminating engineers to increase the intensity of office, shop and home lighting to higher levels without, at the same time, raising the temperature unduly. Developments in pigment types and in paint formulation give indications of reflection in the ultra-violet of the same order of magnitude as in the visible spectrum, which may lead to dual purpose lighting. The so-called pearlescent or opalescent finishes, so popular in pyroxylin lacquer coatings, have, during the year 1939, been produced in synthetics with a consequent improvement in the appearance of industrial synthetic enamels.

Coloured pigments in general have shown an improvement in quality, light stability and chemical resistance; and some new pigments, such as the phthalocyanine green, have been offered on the market.

The shortage of raw materials, more especially oils, has inspired more intensive research, with the result that substitutes for tung oil, both compounded and chemically manipulated (dehydrated castor), have appeared and have considerably relieved the shortage. Soybean oil has received its share of attention from the new U.S. Department of Agriculture Regional Laboratories, and from private investigators, resulting in a rather pronounced increase in consumption. Still further work along agromonomical and chemical lines and in processing technique will quite certainly broaden the scope of this interesting oil.

On the whole, the situation might be summarized as a general improvement in paint, varnish and lacquer formulations, supplemented by developments in raw materials, and a more thorough technical understanding of protective coating performances. (See also ELECTRIC LIGHTING.)

Palaeontology. In Russia, A. N. Riabinin published an account of the discovery of dinosaurs, turtles and fishes in the Tashkent-Chimkent district of South Kazakhstan. Several new forms of each of these groups are named. The beds in which these fossils occur are regarded as Upper Cenomanian and Turonian in age. The presence of the remains of sauropodous Dinosauria (Titanosauridae) has been established; a discovery of much interest as indicating a further extension of this already widely dispersed family.

In the United States, several important advances have been made in vertebrate palaeontology. C. Lewis Gazin described new genera and species of Palaeocene mammals from a new locality in central Utah. This assemblage displays a stage of development indicating them to be intermediate in age between the well established faunas of the Puerco and Torrejon of the New Mexico region. Messrs. E. H. Barbour and C. B. Shultz described a new genus of camel from the Pleistocene deposits of south-western Nebraska. This gigantic new animal (*Gigantocamelus*) is said to have attained a height of 12 feet. A fossil egg from the Permian of Texas described by A. S. Romer and L. L. Price is unique in being the most ancient egg of a vertebrate animal ever found. It is thought to have been laid by one of the early reptiles.

A skull of the curious horned mammal *Braurotherium* from the Tertiary of India and a new rodent (*Mastomys*) were described by Dr. G. Edward Lewis. For the first time the complete osteological structure of the Stegocephalian, Seymouria, from the Permian was made known by the published studies of T. E. White.

The republishing of a revised edition of William D. Matthew's important work *Climate and Evolution* by the New York Academy of Science is an event of much importance to all palaeontologists.

In invertebrate palaeontology, one of the important papers of 1939 is by Kenneth E. Caster, describing a hitherto unknown Middle Devonian fauna from Colombia, South America. In this article the stropheonid Brachiopoda are revised. Another important advance is a monographic study of the foraminiferal family Nonionidae by Joseph A. Cushman. It is world wide in the scope of materials treated and includes all of the known forms of this family from the Jurassic up through the Tertiary, including the living members. A paper by Charles E. Resser describes the first complete Middle Cambrian fauna from the Wasatch mountains of Utah and Idaho. A great number of new forms are described.

During 1939, A. Okladnikov published an account of the discovery of the skeleton of a Neanderthal child associated with characteristic Mousterian implements and an old fauna in a cave near Baisun, Uzbekistan, Central Asia. This find greatly extends to the eastward the known occurrences of Neanderthals and for the first time establishes the existence of this rare skeleton in Central Asia. This discovery will exert a profound impression on the concepts of human prehistory in the Old World, and will necessitate

a material revision of ideas relating to the Neanderthal phase of human antiquity. (See also GEOLOGY; ZOOLOGY.)

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Palestine. Area 10,429 sq.mi. (water 272 sq.mi.); pop. (est. Dec. 31, 1938) 1,435,285; immigration (1938): Jews 12,868; Arabs 473; others 1,922. Chief towns (pop. est. 1938): Jerusalem (cap. 139,000); Haifa (104,000); Jaffa (77,000); Tel-Aviv (130,000). High Commissioner: Sir H. A. MacMichael; languages: English, Arabic, Hebrew; religions (1938): Mohammedan 900,250; Jewish 411,232; Christian 111,974.

History.—The year 1939 opened with the preliminaries for the conferences with representatives of the Jewish Agency, of the Palestinian Arabs and of the neighbouring Arab States, which the colonial secretary had announced the previous December were to be held in London.

These preliminaries took place first in Cairo, where, under the presidency of the Egyptian prime minister Mohamed Mahmud Pasha, representatives of Egypt, Saudi Arabia, the Yemen, Iraq and Trans-Jordan met to decide the composition of the Palestinian Arab delegation, and later in London where the colonial secretary sought to establish contact with each of the delegations in order to create a propitious atmosphere for the actual conference.

After protracted discussions and frequent communication with the Mufti at Beyrouth it was arranged that the Defence Party, the bitter opponent of the Mufti's Party, would join the official Palestinian Arab delegation. But when the conference assembled in London a hitch occurred and the London talks opened at St. James's Palace on February 7 without any Defence Party delegates.

Thanks, however, to the colonial secretary and the representatives of the Arab States a compromise was reached and two members of that party were included in the official Palestinian Arab delegation. The conference took place separately with the Arab and with the Jewish delegations, the discussions being conducted on parallel lines. To each the British prime minister delivered an inaugural speech.

Right at the outset the question of the correspondence between Sir Henry MacMahon and the Sherif Hussein was raised and the British Government, which had hitherto refused to do so, published the correspondence on March 3 as a *White Paper*. After lengthy discussion regarding the disputed passages, which the Palestinian Arabs considered confirmed their claim to Palestine, an Anglo-Arab committee of the conference was formed under the chairmanship of the lord chancellor to examine the questions raised.

In a *White Paper* published on March 21 the committee reported that both the Arab and the United Kingdom representatives had tried to understand each other's point of view but that they had been unable to reach agreement upon an interpretation of the correspondence. The United Kingdom representatives considered that the Arab contentions had greater force than had appeared hitherto. They maintained that on a proper construction of the correspondence Palestine was excluded from the area claimed by the Sherif of Mecca. But they agreed that the language in which its exclusion was expressed was not so specific

and unmistakable as it was thought to be at the time. The committee was further of opinion that His Majesty's Government were not free to dispose of Palestine without regard for the wishes and interests of its inhabitants. Meanwhile the conference itself had continued. The British proposals for an agreed settlement, finally submitted on March 15 to both the Arab and Jewish delegations, proved acceptable to neither and the conference ended on March 17 with the British Government considering the situation with a view to producing their own statement of policy.

The Arab delegates all returned to Cairo where further meetings were held to endeavour to find a formula acceptable to both the British Government and the Palestine Arabs. The Egyptian ambassador in London, Hassan Nashat Pasha, flew out to Cairo with new British proposals and returned with the observations of the Arab and Egyptian delegates. No compromise could, however, be found and on May 17 the British Government issued in *White Paper* form its own statement of policy. In this *White Paper* His Majesty's Government declared unequivocally that it is not part of their policy that Palestine should become a Jewish State nor is there any justification for the Arab claim that it should become an Arab State. The objective of the policy was stated to be "the establishment within ten years of an Independent Palestine State in such treaty relations with the United Kingdom as will provide satisfactorily for the commercial and strategic requirements of both countries in the future."

This would be achieved by placing Palestinians in charge of Government departments with British advisers, subject to the High Commissioner's control, and by giving them seats on the Executive Council, which would ultimately be converted into a Council of Ministers. After five years a body representing the British Government and the people of Palestine would make recommendations for the constitution of an Independent Palestine State.

His Majesty's Government would require to be satisfied that in both the treaty and the constitution contemplated adequate provision had been made for the security of, and freedom of access to, the Holy Places, the protection of the various religious bodies, the special position of the Jewish National Home and the strategic requirements of the British Empire. If at the end of ten years His Majesty's Government considered that circumstances required the postponement of the establishment of the Independent State they would consult with representatives of the people of Palestine, the Council of the League of Nations and the neighbouring Arab States before deciding on such a postponement. Jewish immigration would be permitted for the next five years at the rate of ten thousand a year, and twenty-five thousand refugees would be admitted as soon as the High Commissioner was satisfied that provision could be made for them. After the period of five years no further Jewish immigration would be permitted unless the Arabs of Palestine acquiesced in it.

Finally the High Commissioner would have powers to prohibit and regulate transfers of land throughout the transitional period from the date of publication of the *White Paper*.

Immediately on the publication of the *White Paper*, Egypt and the Arab States declared through the Egyptian premier that their Governments felt unable to recommend the inhabitants of Palestine to collaborate with the British Government on the basis of the *White Paper* proposals.

These proposals were rejected by the Zionists and the Mufti's Party. The Defence Party, however, accepted them. On May 23 both Houses of Parliament approved the policy of H.M.'s Government relating to Palestine and on July 21 the colonial secretary gave the House of Commons an assurance that if the League Council reached a decision which in their view made it necessary to alter the mandate, H.M.G. would take no step without consult-

ing parliament.

During the first three months there had been an uninterrupted series of outrages in Palestine in which numerous Jews and Arabs were killed and the British forces and police suffered casualties. But, by the end of April, public security had sufficiently improved for the Government to consider that Sir Charles Teggart could safely relinquish his appointment as police adviser.

The publication of the *White Paper*, was, however, followed by a revival of unrest confined almost exclusively to the Jews which started with a 24-hour strike, mass demonstrations in Jerusalem and Tel-Aviv and a protest-procession by Jewish women.

Acts of violence, mainly Revisionist, continued for some time and the Palestine problem began to manifest a new feature in the form of a marked increase in illegal immigration.

So serious did this effort to get round the restriction imposed by the *White Paper* become that the colonial secretary announced on July 12 that he had authorized the High Commissioner to suspend the immigration quota for the next half-yearly period and that whether there would be a resumption of immigration quotas would depend on whether illegal immigration continued. This decision dissatisfied the Jews but gave great satisfaction to the Arabs.

The outbreak of war found the rebellion in full process of disintegration, various Arab leaders having either surrendered or been killed. All factional fighting ceased in response to an appeal for a truce from the High Commissioner, which was followed by offers from both the Arab and the Jewish communities of services to the mandatory power. The Jewish community within a month enrolled 90% of the Jews eligible between the ages of 18 and 50, and in many directions there were welcome instances of close Arab and Jewish co-operation in defence of their interests which the war had made mutual. (A. MN.)

Education.—1937–38: Arab public system maintained by Government, 402 schools (11 with secondary sections), 49,000 scholars; Moslem schools, private 184 (2 with secondary sections) with 14,052 scholars; Jewish schools 662 (including 6 training colleges and 27 secondary, 14 technical and 13 agricultural schools) with 71,376 scholars; Christian schools 193 with 24,046 scholars; Hebrew university, Jerusalem; 75 teachers, 733 students.

Banking and Finance.—Revenue (1938–39) £P.5,937,280; expenditure (1938–39) £P.5,692,671; public debt (March 31, 1939) £P.4,475,000; surplus balance (April 1, 1939) £P.2,533,265; notes in circulation (June 30, 1939) £P.5,931,967; exchange rate: £P.1=£1 sterling.

Trade and Communication.—Overseas trade 1938 (merchandise): imports (excluding military stores) £P.11,356,963; exports, domestic £P.5,020,368; re-exports £P.663,217. Communications and transport 1938: roads, all weather 1,783km.; seasonal 1,758km.; railways, standard gauge 280mi.; narrow 92mi.; airways: passengers 600, mail 88,213kg.; shipping, entered 1,971 vessels; 5,201,473 net tons. (Dec. 31, 1938) Motor vehicles licensed: 3,935 private cars, 1,031 public cars, 750 buses, 2,592 trucks and vans, 1,182 cycles; wireless receiving set licences 35,708; telephone subscribers, number 9,241.

Agriculture and Minerals.—Production 1938 (in metric tons): potash (exports) 50,288; oranges (exports 1938–39) 13,055,420 cases, (value) £P.3,865,292; barley 66,736; wheat (1938) 44,435; (1939) 136,100; olive oil (exports) 78,977; melons and water-melons 114,805; grapefruit (exports 1938–39) 2,066,833 cases, (value) £P.445,148; wine 31,000 hectolitres; maize 8,000; tobacco (1937) 2,500; potatoes (1937) 9,500; sesamum 4,000. (See also MINORITIES.) (W. H. WN.)

Panamá, a republic at the juncture of Central and South America; language, Spanish; capital, Panamá; president, Dr. Augusto Boyd; area, including the Canal Zone (under United

States jurisdiction): 34,169 sq.mi. The population was officially estimated at 547,536 in 1937 (1930 census: 467,459). The chief cities (with 1930 pop.) are: Panamá, 82,827; Colón, 33,460; Penonomé, 16,074; David, 16,004.

On July 25, 1939, after Panamá had suspended payments on her bonded indebtedness (held largely by United States citizens) in protest against the United States Senate's failure to ratify a treaty adjusting canal annuities, final ratification was obtained. Under the new treaty, Panamá receives \$430,000 annually instead of the former "\$250,000 gold." Upon outbreak of war in Europe, Panamá co-operated closely with the United States in measures for the protection of the Canal Zone, and was host to the Inter-American Congress at Panamá City (Sept. 1939). (See HISPANIC AMERICA AND THE EUROPEAN WAR.) Dr. Juan Demóstenes Arosemena, president since 1936, died on December 16 after a long illness. Dr. Augusto S. Boyd, eminent physician and Ambassador of Panamá at Washington, D.C., became acting president for the remainder of the presidential term (to Aug. 1940).

Panamá has 257mi. of railway and over 800km. of good highway, with more under construction. Her strategic position in relation to all parts of the Western Hemisphere makes her the hub of inter-American air and maritime transport. Imports, principally textiles and foodstuffs, aggregated \$17,651,454 in 1938, with 57% supplied by the United States; 9.3% by Japan. Exports, with bananas comprising 35%, were \$3,769,561 (88.6% to the United States). Re-exports were \$3,899,005. Tourist and Canal Zone purchases normally offset the "unfavourable trade balance." The Panamanian merchant marine, largest in Hispanic America (133 ships of 602,661 gross tons in 1938) was materially increased by transfers from United States registry in 1939. The monetary unit is the *balboa* (equal to the U.S. dollar). In the school year 1938–39 there were 629 primary schools (544 rural), with 61,706 pupils and seven secondary schools (3,830 enrolment). The National university (411 students in 1939) is at Panamá. Panamá has no army or navy, but maintains a national police force of 1,200. (L. W. BE.)

Panama Canal and Canal Zone, area, 553.8 sq.mi., of which 170.2 are water; population, June 1939, exclusive of Army and Navy personnel, 28,978, of whom 8,979 were United States citizens. The length of the canal from shore line to shore line is 40.27 miles. Both canal and zone are under the jurisdiction of the United States.

The Panama canal connects the Atlantic and Pacific oceans through the narrow isthmus of Panama, at approximately 9° N. lat. and 79° W. long. It was opened to traffic on August 15, 1914.

Revenues for the fiscal year 1939, principally from tolls, totalled \$24,487,616 and the net appropriation expenses were \$9,965,272, which left a net revenue of \$14,522,344, or a return of 2.86%, to the U.S. Government on its investment in the canal enterprises. The gross capital investment as of July 1, 1938, was \$540,694,148 and the net investment, after deducting reserves, was \$508,346,823. An interest return of 3% on this capital investment would have been \$15,250,405 from the year's operations, or \$728,061 more than was actually realized.

During the fiscal year ended June 30, 1939, there were 5,903 transits of ocean-going commercial vessels in comparison with 5,524 in the preceding year and 5,387 in the fiscal year 1937. Of the total number of commercial transits during the fiscal year ended June 30, 1939, 1,788 were of United States registry, 1,502 British, 704 Norwegian, 361 German, 261 Japanese, 312 Netherlands, 200 Danish, 193 Panamanian, 157 Swedish, 107 French and the remaining 318 of 11 other nationalities.

The origin and destination by principal trade areas of cargo in vessels passing through the Panama canal during the fiscal year

Traffic through the Canal for the Last Eleven Fiscal Years

Fiscal year ending June 30	Southbound (Atlantic to Pacific)		Northbound (Pacific to Atlantic)		Total		Tolls levied
	Vessels*	Cargo, tons	Vessels*	Cargo, tons	Vessels*	Cargo, tons	
1929	3,279	9,873,529	3,010	20,774,239	6,289	30,647,768	\$27,111,125
1930	3,051	9,472,061	2,976	20,546,368	6,027	30,018,429	27,959,999
1931	2,717	6,670,718	2,653	18,394,565	5,370	25,065,283	24,624,600
1932	2,273	5,631,717	2,089	14,167,269	4,362	19,798,986	20,604,705
1933	2,184	4,597,070	1,978	13,654,095	4,162	18,161,165	19,601,077
1934	2,753	6,162,649	2,481	18,541,360	5,234	24,704,009	24,047,183
1935	2,676	7,529,721	2,504	17,779,806	5,180	25,309,527	23,397,063
1936	2,770	8,249,899	2,612	18,256,044	5,382	26,505,943	23,479,114
1937	2,865	9,805,632	2,522	18,212,743	5,387	28,108,375	23,102,137
1938	2,946	9,688,560	2,578	17,697,364	5,524	27,385,924	23,169,889
1939	3,146	9,011,267	2,757	18,855,360	5,903	27,866,627	23,661,021

*Ocean-going commercial vessels, over 300 net tons Panama canal measurement, excluding canal vessels, Army and Navy, Panamanian Government, Colombian Army and Navy vessels.

ended June 30, 1939, is shown in the following table:

From Atlantic to Pacific

	Cargo, tons
United States intercoastal	2,391,523
United States and Far East (including Philippine Is.)	2,871,207
Europe and South America	415,697
Europe and Canada	78,789
Europe and United States	337,401
East coast United States and west coast South America	192,732
Europe and Australasia	542,770
United States and Australasia	374,544
All other trade routes	1,806,604
TOTAL	9,011,267

From Pacific to Atlantic

	Cargo, tons
United States intercoastal	4,493,203
Far East and United States (including Philippine Is.)	1,199,530
South America and Europe	2,481,541
Canada and Europe	2,539,436
United States and Europe	2,349,888
West coast South America and east coast United States	2,447,257
Australasia and Europe	759,794
Australasia and United States	86,999
All other trade routes	2,497,712
TOTAL	18,855,360

The principal commodities transported through the canal during the fiscal year ended June 30, 1939, segregated by direction of transit, were as follows:

From Atlantic to Pacific

	Long tons
Manufactures of iron and steel	1,495,497
Scrap metal	1,200,368
Mineral oils	1,032,671
Paper and products	402,264
Metals, various	400,285
Cotton, raw	250,752
Sulphur	234,879
Phosphates	202,981
Tinplate	194,186

From Pacific to Atlantic

	Long tons
Lumber	3,191,093
Mineral oils	2,777,201
Ores	1,991,690
Wheat	1,539,474
Nitrate	1,444,148
Sugar	1,329,276
Canned food products	1,232,636
Metals, various	674,314
Fruit, fresh	419,109
Fruit, dried	337,769
Cold storage (food products) (except fresh fruit)	335,874
Barley	259,612
Soybeans	236,099
Wood pulp	235,768

Tolls are levied on the net tonnages of ships. Prior to March 1, 1938, the rate for laden ships was \$1.20 per net ton, Panama

canal measurement, and for ballast ships \$0.72 per net ton, with the proviso that the amount collectible shall not exceed the equivalent of \$1.25 per net ton as determined under the rules for registry in the United States, or be less than \$0.75 per net ton on the same basis. However, during 1937, legislation was passed by the U.S. Congress, which made the Panama canal rules for measurement the sole basis for levying

tolls. Commencing March 1, 1938, tolls were assessed at \$0.90 per net ton for laden vessels and \$0.72 per net ton for ballast vessels based on new rules of measurement of the Panama canal. During the fiscal year ended June 30, 1939, tolls collections averaged \$4,008 per vessel of over 300 net tons, Panama canal measurement. (C. S. Rr.)

Panama Conference: see HISPANIC AMERICA AND THE EUROPEAN WAR; MEXICO.

Pan-American Union, an international body created by the 21 American republics for the fostering of mutual understanding and co-operation, with the essential duty of making effective the resolutions adopted by the successive Pan-American Conferences; headquarters, Washington; director general, Dr. Leo S. Rowe. A governing board plans inter-American gatherings for the purpose of conferring on problems of interest to all. A general conference of the member republics is held quinquennially. In 1939 the Union was active in making effective the resolutions adopted by the Eighth Pan-American Conference at Lima, aiding the special committees and conferences provided for by the Lima session. Most notable among its 1939 activities, however, were the Panamá congress of the ministers of foreign affairs of the American republics in September to determine joint action in the face of the European war (see HISPANIC AMERICA AND THE EUROPEAN WAR), and the resultant special conferences to provide the machinery for the declared neutrality. The Union is financed by contributions from its 21 members on the basis of population, and, because of its increased activities in 1939, membership assessments were increased. It has several important subdivisions, devoted to such specialized activities as foreign trade, intellectual co-operation, and agricultural co-operation.

BIBLIOGRAPHY.—Pan-American Union, *Bulletin* (monthly); *Pan-American Bookshelf* (monthly). (L. W. Br.)

Paper and Pulp Industry. The pulp and paper industry in the United States in 1939 was featured by the war conditions and increased business resulting therefrom. Paper production in Dec. 1938 was at about 74.4% of capacity and by Oct. 1939 had risen to 83%. Paper board during the same period rose from 61% to 83%. During the year two new mills were under construction, a newsprint mill at Lufkin, Texas and a cigarette paper mill at Brevard, N.C. There has been considerable expansion of existing mill properties.

In the paper board industry considerable progress is being made in the manufacture of containers of all kinds, largely at the expense of the lumber and cotton goods industries. In paper manufacture considerable advances are being made by the machine coating processes wherein a product is being made that is replacing paper coated by the slower coating methods. In pulping there is a continued trend toward the use of forced circulation and in the

kraft process vacuum washers have replaced diffusers in a number of mills. The production of tallol and fatty acids, as kraft mill by-products, has become an important factor.

World's Wood Pulp Balance Sheet
1938 Estimated—Short Tons

	Con- sumption	Imports	Pro- duction	Exports
United States	7,546	1,711	5,975	140
Canada	3,085	17	3,022	544
Germany	2,805	172	2,715	82
Great Britain . . . . .	..	1,812	218	..
Japan	1,101	161	940	0
France	806	436	375	5
Sweden . . . . .	..	..	3,384	2,185
Russia	1,070	0	1,070	0
Finland	1,099	0	2,472	1,373
Norway	427	17	976	566
Italy	522	294	228	..
Others	1,278	638	784	187

Note: Since all data for 1938 are not available the following figures for 1937 are helpful: Great Britain—consumption 2,223, exports 10; Sweden—consumption 1,082, imports 12; Italy—exports 0.

United States Paper Production
In Short Tons (U.S. Census)

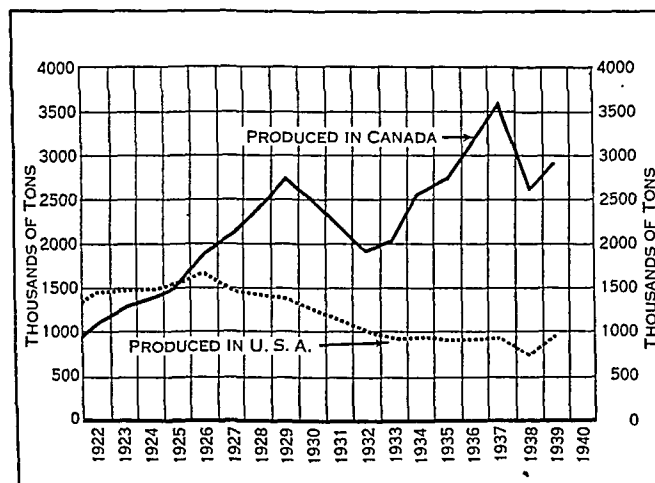
	1935	1936	1937	1938
Newsprint and similar papers	947,717	938,287	975,854	1,090,000
Book papers and coating raw-stock	1,281,870	1,438,046	1,520,523	1,424,000
Paper board	4,695,890	5,454,637	5,802,036	5,137,000
Wrapping	1,632,054	1,879,323	2,053,387	1,897,000
Writing	597,325	603,853	578,147	519,000
Cover	20,806	24,000	24,437	21,500
Tissue	473,314	494,721	546,152	500,000
Building	449,704	549,701	608,086	568,000
All other, including absorbent	177,192	238,117	196,317	180,000
Total—all grades	10,521,747	11,620,685	12,304,939	11,327,500

United States Production and Consumption of Paper, Wood-pulp, and Pulpwood (Estimated)

	Paper Tons		Wood-pulp Tons		Consumption of Pulpwood (Cords)		
	Production	Consumption	Production	Consumption	Domestic	Imported	Total
1934	9,186,266	11,185,682	4,425,669	5,069,633	5,979,700	817,000	6,796,700
1935	10,506,195	12,490,886	4,944,226	6,877,869	6,509,942	1,037,332	7,628,274
1936	11,670,000	14,546,046	5,695,219	7,420,829	7,506,156	1,209,760	8,715,916
1937	12,837,003	16,055,681	6,573,918	8,692,489	8,377,132	1,522,868	9,900,000
1938	12,860,000	16,000,000	5,934,000	7,546,000	8,194,000	1,030,000	9,224,000

Canada.—Business conditions in Canada reflected world conditions and in particular those of the United States, where so much newsprint is sold. Business started in 1937 under weak conditions and increased rapidly after mid-year. Although prices were increased these were offset considerably by the rising costs of raw materials, etc.

Board mills had an excellent year, particularly containers for the retail trade.



PRODUCTION OF NEWSPRINT in the United States and in Canada. Compiled by News-Print Service Bureau, New York city

There was no new mill construction during the year other than the rebuilding of the Gaspesia Paper Mill at Chandler, Quebec. There was, however, some expansion in existing mills.

An interesting technical development was the starting of a plant at Cornwall, Ont., mill of the Howard Smith Paper Company for the production of vanilla from sulphite waste liquor. At an earlier date the manufacture of yeast from this liquor was started at the Liverpool, N.S., mill of the Mersey Paper Company. These projects demonstrate the possibilities of producing chemical by-products from pulp mill wastes.

United Kingdom.—The paper business in the United Kingdom continued to be good in 1938 and in part of 1939. Although no official statistics have been issued since 1935, by the Board of Trade, the following for 1938 and probably for 1939 (in long tons) are approximately correct in so far as the use of raw materials is concerned.

Raw Materials in Paper Production, Great Britain

Material in Long Tons	Paper	Board
Bleached sulphite	117,000	18,000
Unbleached sulphite	555,000	25,000
Sulphate	212,000	38,000
Mechanical	703,000	47,000
Knotter	3,000	17,000
Esparto	130,000	..
Rags, etc.	50,000	..
Waste paper	10,000	290,000
Loading, etc.	220,000	15,000
	2,000,000	450,000

Price problems were the most important concern during 1939. The sale of newsprint was uneconomic since much of this material was bought for 1938 and 1939 on 1936 prices. In spite of price increases kraft mills ran to capacity. It is difficult to estimate (Jan. 1,

1940) the effect of European war conditions since some mills were turned over to munitions manufacture. There was probably a considerable increase in paper imports to offset this temporary decrease in production.

The total paper and board produced in 1939 was 2,306,452 long tons.

The total consumed was 3,200,000 tons.

(R. G. M.)

Paper Milk Containers: see CELLULOSE PRODUCTS.

Papua: see BRITISH EMPIRE; PACIFIC ISLANDS, BRITISH.

Paraguay, an inland republic in southern South America; language, Spanish; capital, Asunción; president, General José-Félix Estigarribia. The area is 154,165 square miles. The population (1936 census: 936,126) was officially estimated at 954,848 on Dec. 31, 1938. The chief cities are: Asunción, 104,819; Villarrica, 20,000 (est.); Concepción, 11,000 (est.); Encarnación, 10,000 (est.); Paraguari, 10,000.

History.—The dominant feature of Paraguayan development during 1939 was the economic and political rehabilitation begun under the leadership of General José Félix Estigarribia. Presidential elections called by Provisional President Félix Paiva were held on April 30, and General Estigarribia, hero of the Chaco War and the Chaco Peace, and, at the time, Paraguayan minister at Washington, D.C., was elected president without formal opposition. Before leaving Washington to be inaugurated on August 15, the president-elect and Pablo Insfran (later named as minister of Economics) carried on negotiations with the United States Gov-

ernment with the result that the United States Export-Import Bank granted credits to the extent of \$5,000,000. Technical advisers were obtained to assist in a program of renovation. Already, in Feb. 1939, United States Tariff Commissioner Harold D. Gresham had been loaned to the Paraguayan Government to act as an adviser in tariff and related matters.

Recognizing that one of the country's outstanding needs was the development of communications in order to break the monopoly of Argentina on Paraguayan external trade, with its accompanying high freight rates (Asunción-Buenos Aires freights exceed those from Buenos Aires to Europe), the Government began plans for a rail and highway connection to the Brazilian border, to link with a Brazilian railroad from the port of Santos. Construction was begun on the 220km. Asunción-Villarrica highway, while the new minister of economics gave particular attention to development of the country's latent resources. A "most-favoured-nation" treaty with Uruguay was concluded, along with commercial treaties with Argentina and Bolivia. Development of immigration (4,473 in 1938, of whom 3,604 were Poles) was accelerated, and Czech refugees were especially encouraged.

Education.—In 1937 Paraguay had 1,742 schools (enrolment: 139,466), including 129 private schools, with 6,179 pupils, 8 normal schools, and 12 secondary schools (2,500 enrolment). The National university at Asunción, had 847 students.

Finance.—The monetary units are the paper and gold peso, both based on Argentine currency (values: approximately $\frac{1}{3}$ ¢ and 68¢ U.S.).

Trade and Communication.—External communication is primarily by way of the Paraná river, with regular steamship service, and by railway and air service to Argentina. There are 1,147km. of railways. The highway system is in process of development.

Imports are chiefly foodstuffs, textiles, and machinery, and totalled 13,082,101 gold pesos in 1938. They were derived chiefly from Argentina (38.5%), Japan (15%), Germany (11.5%), Great Britain (9.7%), United States (9.6%). Exports totalled 12,017,228 gold pesos, and went chiefly to Argentina (47.1%, including 25.7% in transit), Germany (12.25%), Great Britain (13%), and the United States (12.3%). Exports are agricultural products, of which cotton comprises three-fourths; forest products, primarily quebracho logs and extract; and animal products, especially processed meats.

Resources.—Paraguay's resources are agricultural, pastoral and forestal. Cotton, mate (Paraguay tea), tobacco, sugar and citrus fruits are the leading agricultural commodities. Cattle are the principal livestock. Quebracho and its extract (tannin) are the most important forest products. Manufacturing is on a small scale and for domestic consumption, except for processed meats and some fine lace work for export.

Defence.—In 1939 Paraguay's defence forces included an army of some 10,000 men, and a navy of two gunboats. (L. W. BE.)

Parapsychology: see PSYCHICAL RESEARCH.

Parents and Teachers, National Congress of.

The National Congress of Parents and Teachers represented locally by parent-teacher associations was established in Washington, D.C., Feb. 17, 1897. On April 15, 1939, there were 2,291,420 active memberships enrolled in 27,111 parent-teacher associations in 49 State branches (including the District of Columbia) and in Hawaii and Puerto Rico. Approximately 63% of these associations are in elementary schools, 11% in junior and senior high schools, and 15% in 11- and 12-grade schools. Approximately 10% of the membership is composed of teachers.

Congress parent-teacher associations through their various ac-

tivities have for their purpose the education and welfare of youth. The activities of the parent-teacher associations vary with the type of school with which they are connected, the educational system under which the school operates, the customs and habits of the members of the group, and the social and economic life of the community. These activities relate to art, character education, child hygiene, exceptional child, home education, homemaking, humane education, international relations, juvenile protection, legislation, library service, mental hygiene, motion pictures and visual education, music, parent education, radio, recreation, safety, school education, social hygiene, student aid, and study of the use and effects of alcohol and narcotics.

The official parent-teacher magazine is the *National Parent-Teacher*, which is issued ten times a year. The *National Congress Bulletin* is sent monthly from September to June to every local president and to additional subscribers. The office of the National Congress is at 600 S. Michigan boulevard, Chicago, Ill. (J. K. P.)

Paris. From the beginning of 1939 preparations in case of war progressed steadily in Paris. A plan had been drawn up for closing half the "metro" stations and converting them into air raid shelters, the sections of line remaining open to be made impervious to gas and equipped with apparatus for filtering incoming air. The Prefect of the Seine received a credit of approximately £800,000 for the scheme, and work was started in January. The construction of underground roads to maintain communications in war and to relieve traffic congestion in peace-time continued. Some weeks before war broke out voluntary evacuation was urged upon all whose presence in the capital was not a necessity, and arrangements were made to allot each *arrondissement*, or district of the city, to a safe region in the surrounding country. By August 30, the compulsory evacuation of school children was well under way, and on that day nine hospital trains were drawn up at the Austerlitz station to remove the inmates from hospitals. The evacuation of certain Government departments, banks and other businesses (dressmakers removing to Biarritz) went on into September. Animals from the Vincennes zoo were distributed among collections throughout France. Trenches and shelters had long been made ready.

Steps were taken, as war approached, to safeguard the art treasures of Paris. The stained glass was taken from the Sainte Chapelle and from the cathedral of Chartres. The Louvre and other museums were stripped of their contents, which were taken to secret refuges among the former royal châteaux. The city's principal monuments and statues were sandbagged or boxed in.

Nearly 2,000,000 people were withdrawn from Paris and its suburbs in September. As the city remained unmolested, evacuated persons began to return in increasing numbers, against the advice of the authorities. Schools therefore re-opened on October 16 and the university faculties started work on November 6, public libraries also partly re-opening. Taxicabs and buses became more plentiful and shops re-opened, and cafés were keeping practically normal hours. The black-out, never as complete as in London, was relieved by increased street and shop-window lighting; on Jan. 4, 1940, it was made an offence for a pedestrian not to carry at night a torch, which must be flashed when crossing the road.

Apart from war preparations, there was some building activity during the year. Decrees were passed (February 28) remitting death duties on new properties within certain periods, which stimulated building, until it was checked by the war. Notable buildings completed in 1939 were: the new ministry of Posts, Telegraphs and Telephones, in the Avenue de Saxe et de Ségur, covering 10,000 sq.m.; the new theatre under the terrace on the site of the

old Trocadéro building on the right bank of the Seine, with seating for 2,800 people; and the museum of the ministry of Public Works designed by the Perret brothers on a neighbouring site. The renovation of the interior of the Opéra, delayed by the fire of September 26, was completed and a new lighting system installed. The city of Joan of Arc, a large slum in south-east Paris, was cleared to make room for new flats.

Park, William Hallock (1863–1939), U.S. immunologist and authority on public health, often called "the American Pasteur" because of his research in toxin anti-toxin, was born in New York city on December 30. He graduated from the College of the City of New York in 1883 and received his medical degree from Columbia three years later. In 1889 and 1890 he studied at the University of Vienna. From 1894 to 1937 he was director of the Bureau of Laboratories in the health department of New York city; he was also professor of bacteriology and hygiene at the medical college of New York university from 1897 to 1937. In 1908 two assistants, working under Dr. Park's direction, purified the anti-toxin for diphtheria. It was used with a great incidence of success in the public schools of New York city. Dr. Park was also inventor of a process for purifying milk and developed a new serum for infantile paralysis. He died in New York city on April 6.

Parks and Monuments: see NATIONAL PARKS AND MONUMENTS.

Parliament, Houses of. On August 2 the British Parliament was adjourned until October 3; but owing to the situation caused by the Danzig crisis an emergency session was held on August 24, when the prime minister and the foreign secretary made statements to the Commons and the Lords respectively and the Emergency Powers Act was passed. Parliament was prorogued on November 23, and the new session was opened by the King on November 28.

House of Commons.—Before the outbreak of war there were, during 1939, 19 by-elections to the British House of Commons, 17 of these being contested and 2 unopposed. A change of representation was brought about in two seats, as the result of Labour gains. At North Southwark on May 17 a former Liberal National majority of 79 was converted into a Labour majority of 1,493; and at Brecon and Radnor on August 1 a National majority of 2,169 became a Labour majority of 2,636. On September 8 it was announced that the political parties had agreed that, during the war, no by-elections should be contested, but that when a seat fell vacant a representative of the party previously holding it should be returned unopposed. There were 9 by-elections subsequent to this agreement, and in the case of two of these the party truce was violated and the election was contested. At the Clackmannan and East Stirling by-election, the result of which was declared on October 14, a Pacifist candidate entered the field, but polled only 1,060 votes against his Labour opponent's 15,645; and at Stretford (Lancs.) on December 8 the Conservative, elected with 23,408 votes, was opposed by an Independent Labour Party candidate who polled 4,424 and a Communist who polled 1,519 votes.

On April 14 the Select Committee issued its report on the question whether the Speaker should be required, when in office, to take part in a contested election. The committee was strongly in favour of continuing the present practice of contesting the Speaker's seat. The House of Commons Member's Fund Bill, which passed its third reading on July 25, provided for pensions for ex-members of the House of Commons, or their widows, who might be in reduced circumstances. A precedent of the World

War was followed on December 13, when a secret session of the Commons was held to debate on the organization of supplies for the prosecution of the war.

House of Lords.—At the close of 1939, 783 peers were entitled to sit in the House, viz., 4 royal peers, 2 archbishops, 20 dukes, 28 marquesses, 129 earls, 86 viscounts, 24 bishops, 461 barons and 16 Scottish and 13 Irish representative peers. Many of the most able of these, as holders of Crown appointments overseas, etc., are virtually debarred from attending, and of the remainder only about 10% actually do so, except on special occasions. Ten peerages became extinct during the year, and new creations were confined to two viscountcies and nine baronies.

On the outbreak of war Sir Thomas Inskip (created Viscount Caldecote) succeeded Lord Maugham (who was raised to a viscountcy) as Lord Chancellor; the Earl of Onslow (Chairman of Committees) and Lord Snell and the Marquess of Crewe (leaders of the Labour and Liberal Oppositions) retained their offices.

Parsons, William Edward (1872–1939), U.S. architect, was born at Akron, O., June 19. In 1905 he was appointed consulting architect to the U.S. Gov't in the Philippines. Later he helped design city plans for Chicago, Ill., Buffalo, N.Y., St. Paul, Minn., Washington, D.C., San Juan, P.R., and other cities. He died December 17 at New Haven, Connecticut. See *Encyclopædia Britannica*, vol. 17, p. 341.

Patents. Appraisal of the patent system as an economic factor has prompted congressional legislation designed to increase its efficiency and its value in the field of industry. The Temporary National Economic Committee commenced its investigations in Dec. 1938 with hearings on the use of patents by several industries. At the next session, Jan. 1939, proposals for changes in law and procedure were presented by the commissioner of patents, and testimony on the operation and benefits of the patent laws by inventors, scientists and industrialists. Bills relating to the recommendations of the commissioner were presented in Congress and some of them were enacted in August. Public Act No. 286 reduces the period of permissible publication and public use before an application for patent must be filed from two years to one year. Public Act No. 288 establishes a period of one year beyond which another applicant cannot copy claims from an issued patent for the purpose of interference. Public Act No. 287 simplifies interference practice by eliminating one of the several appeals allowed by law; the internal Patent Office appeal is abolished and the decision by the Office is to be made by a board of three examiners of interference. Public Act No. 341 gives the commissioner of patents authority to fix the time within which response to actions by the Office must be made. Renewals are abolished by Public Act No. 358.

A significant change was made in the patent law of France in July 1939, when the term of patents was increased from 15 to 20 years, counting from the date of filing of the application.

The most recent data and estimates available show that about 154,000 patents were granted by all the countries of the world in 1937. The number granted by some countries during that year were: Australia, 2,642; Austria, 3,800; Belgium, 6,166; Brazil, 1,034; Canada, 7,856; Czecho-Slovakia, 3,100; Denmark, 1,602; France, 16,750; Germany, 14,526; Great Britain, 17,614; Hungary, 1,920; Italy, 9,980; Japan, 4,615; Netherlands, 2,478; Norway, 1,340; Poland, 1,734; Rumania, 1,131; Sweden, 2,953; Switzerland, 6,447; United States, 43,271. In 1938 the United States granted 43,493 patents, and 49,080 were granted in 1939. The total number of patents granted by all the countries to and including 1937 can be estimated as approximately 7,500,000; however, these do not involve that number of distinct inventions

since numerous inventions are patented in a number of different countries.

(C. P. Co.)

Peaches. The 1939 peach crop in the United States was estimated by the Department of Agriculture as 61,730,000 bu., about 19% larger than the crop of 51,945,000 bu. in 1938 and about 14% higher than the ten-year average (1928-37) of 54,151,000 bushels.

Peach Production by States, 1938 and 1939

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
California . . .	23,711,000	20,501,000	Utah	564,000	573,000
Georgia	4,290,000	5,320,000	Kentucky . . .	562,000	352,000
Michigan	2,760,000	1,341,000	Maryland . . .	427,000	352,000
Arkansas	2,709,000	2,451,000	Delaware . . .	422,000	304,000
Pennsylvania . .	2,618,000	1,842,000	Louisiana . . .	409,000	325,000
Illinois	2,057,000	1,480,000	Oregon	391,000	327,000
Texas	1,972,000	964,000	Indiana	378,000	144,000
Tennessee . . .	1,798,000	610,000	West Virginia .	315,000	184,000
New York	1,722,000	1,134,000	Kansas	154,000	43,000
Alabama	1,705,000	1,705,000	Idaho	146,000	181,000
Colorado	1,575,000	1,634,000	Iowa	110,000	90,000
South Carolina .	1,484,000	1,515,000	Connecticut . .	84,000	140,000
New Jersey . . .	1,435,000	1,172,000	Massachusetts .	74,000	88,000
North Carolina .	1,395,000	2,232,000	New Mexico . .	73,000	51,000
Ohio	1,212,000	481,000	Nebraska . . .	70,000	72,000
Washington . . .	1,210,000	1,428,000	Arizona	51,000	22,000
Missouri	1,140,000	116,000	Florida	33,000	68,000
Mississippi . . .	1,034,000	1,061,000	New Hampshire .	17,000	19,000
Virginia	990,000	1,161,000	Rhode Island . .	12,000	27,000
Oklahoma	615,000	429,000	Nevada	6,000	6,000

(S. O. R.)

Peanuts. The 1939 crop of peanuts for picking and threshing was 1,147,245,000 lb. in the United States, the Department of Agriculture estimated November 1. Production in 1938 was 1,309,400,000 lb., and for the ten-year average (1928-37), 989,014,000 pounds. Production in Manchoukuo was estimated at 165,000 short tons. In India a shorter crop was expected as the 1939 acreage was 6,869,000 ac., compared to 8,500,000 in 1938. Figures for the Chinese crop are not available and the volume of peanuts for export is conjectural because of currency problems.

Foreign observers reported it was difficult to sell peanuts for export in China because officials demanded that goods for export must be bought with the new paper money.

U.S. Peanut Production (Picked and Threshed), 1938 and 1939

	1939 lb.	1938 lb.		1939 lb.	1938 lb.
Georgia	325,500,000	469,050,000	Mississippi . .	14,700,000	14,790,000
North Carolina .	282,720,000	249,075,000	Oklahoma . . .	14,625,000	18,550,000
Virginia	184,800,000	146,010,000	Arkansas . . .	14,500,000	11,500,000
Alabama	128,700,000	205,375,000	South Carolina	11,400,000	9,100,000
Texas	120,120,000	117,000,000	Louisiana . . .	5,980,000	6,500,000
Florida	38,950,000	56,250,000	Tennessee . . .	5,250,000	6,200,000

(S. O. R.)

Pears. The United States pear crop in 1939 was estimated by the Department of Agriculture at 30,577,000 bu., or 6%

Pear Production by States, 1938 and 1939

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
California	10,001,000	11,751,000	Iowa	139,000	104,000
Washington . . .	5,770,000	6,500,000	Louisiana . . .	139,000	100,000
Oregon	4,220,000	4,249,000	South Carolina	104,000	129,000
New York	1,740,000	1,960,000	Utah	104,000	127,000
Michigan	1,354,000	1,411,000	Oklahoma . . .	92,000	80,000
Ohio	950,000	634,000	Maryland . . .	81,000	82,000
Pennsylvania . .	918,000	657,000	Florida	60,000	156,000
Illinois	724,000	413,000	Idaho	62,000	67,000
Indiana	527,000	366,000	West Virginia .	56,000	35,000
Missouri	406,000	66,000	Nebraska . . .	55,000	54,000
Texas	406,000	410,000	Massachusetts .	53,000	75,000
Mississippi . . .	348,000	462,000	New Jersey . .	52,000	57,000
Alabama	313,000	383,000	New Mexico . .	45,000	27,000
Georgia	281,000	404,000	Connecticut . .	43,000	49,000
Tennessee . . .	244,000	186,000	Maine	13,000	13,000
North Carolina .	230,000	364,000	New Hampshire .	11,000	15,000
Arkansas	211,000	156,000	Arizona	11,000	6,000
Kentucky	206,000	135,000	Delaware . . .	9,000	7,000
Virginia	189,000	334,000	Rhode Island . .	8,000	11,000
Colorado	188,000	251,000	Vermont	7,000	7,000
Kansas	151,000	56,000	Nevada	3,000	4,000

smaller than the record crop of 32,473,000 bu. in 1938 and 20% above the ten-year average (1928-37) of 25,489,000 bushels. The Canadian crop was estimated at 584,300 bu., compared to 653,400 bu. in 1938.

(S. O. R.)

Pearson, Alfred John (1869-1939), U.S. educator and diplomat, was born in Landskrona, Sweden on September 29 and was taken by his parents to the United States in his infancy. At Bethany college, Lindsborg, Kan. he received his bachelor's degree in 1893 and his master's degree in 1896; in the latter year also Yale university granted him a doctorate of philosophy. In 1907 he was appointed professor of German language and literature at Drake university in Des Moines, Iowa. In 1924 President Coolidge appointed him minister to Poland, and the next year minister to Finland, a post he retained until 1930. Thereafter he was dean of the college of liberal arts at Drake university until his death at Des Moines on August 10.

Peat. The commercial production of peat is widely distributed, and in some European countries the output is of considerable magnitude. In 1935 the Russian output was almost 20,000,000 metric tons, but has since increased; Irish production is about 4,000,000 tons, Polish 2,000,000 tons; few others exceed 100,000 tons. In countries having a large peasant population the bulk of the output is used as a low grade, cheap fuel. In more heavily industrialized countries outputs are smaller, and uses include such items as soil conditioner, fertilizer ingredient, packing material and stable and poultry litter. About 76% of the 1938 sales in the United States were for soil improvement, out of a total output of about 46,000 short tons, supplemented by 69,500 tons of imported material, largely from Germany and Sweden.

(G. A. Ro.)

Pecans: see NUTS.

Pellagra. During 1939, observations from all over the world have confirmed the beneficial effect of nicotinic acid in the relief of the sore mouth, vomiting, diarrhoea and insanity of pellagra. Recent observations show that beriberi (neuropathy from lack of thiamin) and riboflavin deficiency (sores at the corners of the mouth from lack of riboflavin) frequently coexist with pellagra. Hence, it is clear that all manifestations of ill health in the average pellagrins should not be attributed to the lack of a single vitamin. Studies reported from an endemic area show that pellagra is a common disease among infants and children, and that there is a relationship between the inadequate diet of the mother during pregnancy and lactation and the development of the pellagra in the infant and child.

The importance of nicotinic acid, thiamin and riboflavin in relieving pellagra and the associated beriberi and riboflavin deficiency is of general scientific and biological significance in that these three vitamins are building stones in the fundamental processes of biological oxidation and reduction. (See also DIETETICS; VITAMINS.)

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(T. D. S.)

Pemba: *see* BRITISH EAST AFRICA.

Pennsylvania, one of the original 13 States of the United States, popularly known as the "Keystone State," area 45,126 sq.mi. (239 sq.mi. water); population (U.S. census, 1930), 9,691,350; estimate, July 1, 1937 by Census Bureau, 10,176,000. Capital, Harrisburg, 80,339.

Cities with a larger population (census estimates July 1, 1933) were Philadelphia, 1,972,700; Pittsburgh, 678,500; Scranton, 144,400; Erie, 118,300; Reading, 111,600; Allentown, 97,000; Wilkes-Barre, 87,000; Altoona, 82,000. Of the State's population 6,533,511 were urban, or 67.8%; 7,959,551 native white; 1,233,051 foreign born; and 431,357 Negro.

History.—The Republicans in the election on Nov. 7, 1939, carried the State for Marion D. Patterson, as chief justice of the Supreme Court, the highest court in the commonwealth. William H. Keller, president judge of the Superior Court, was re-elected without opposition, having been nominated by the Republicans and indorsed by the Democrats. Thomas J. Baldrige and William E. Hirt, associate judges in this court, were re-elected over Democratic opponents.

The General Assembly of which the Republicans gained control in 1938 at the same time that they displaced a Democratic governor, created a Department of Commerce and Richard P. Brown was appointed as its first head. He has been actively engaged in bringing new industries into the State. After an agitation extending over several years the General Assembly was induced to pass a law forbidding the sale of fireworks save for properly regulated public displays. A survey undertaken after the annual Fourth of July celebration disclosed that there had been no deaths from fireworks compared with eight in the previous year and that there were only 41 injuries as against 1,702 in 1938. Another new law directed that aliens more than 18 years old should register annually with the Department of Labor and Industry and should carry their registration cards with them to be shown on demand of the police. The validity of the law was contested in the United States courts on the ground that the subject was outside the jurisdiction of a State legislature. Late in November the Federal district court declared the act invalid for this reason. Among the acts dealing with labour was one which empowered the courts to issue injunctions against sit-down strikers and provided that employers as well as employees might petition the Labor Relations Board for redress of grievances. The right to reinstatement or to the payment of wages during the time a workman was on strike was denied to workers found guilty of unfair practice. Engaging in a sit-down strike was defined as such an unfair practice. The anti-injunction law affecting labour disputes was further amended so as to permit the issue of a restraining order when there is violation of a valid agreement or when employees engage in practices intended to coerce an employer. The act of the previous legislature intended to prevent a grand jury investigation of charges against executive officers of the State was repealed. The investigation which this law was intended to stop was continued and several officials were indicted. Roy E. Brownmiller, secretary of highways, was convicted of malfeasance and nonfeasance in office in connection with highway payroll frauds in Luzerne county and sentenced to one year in prison and fined \$5,000. He appealed and is out on bail. David L. Lawrence, Secretary of the Commonwealth, was indicted for conspiracy, blackmail and violation of the election laws. When tried late in the fall the jury found him innocent. Another indictment against him for violation of the election laws remains to be tried.

The validity of the graduated chain stores tax, levied by a previous legislature, was contested in court by companies operating the stores. The tax varied from \$100 to \$500 on each store, in-

creasing in amount with the number of stores operated. When the case reached the Supreme Court it was held that the law violated the provision of the State Constitution which directs that taxes must be uniform on the same class of property.

The leading officers are: governor, Arthur H. James; lieutenant-governor, Samuel S. Lewis; secretary of internal affairs, William S. Livengood; attorney-general, Claude T. Reno; treasurer, F. Clair Ross; superintendent of Public Instruction, Francis B. Haas; chief justice, William I. Schaffer.

Education.—On the passage of the Land Grant College act by Congress in 1862 the Pennsylvania State college, founded in 1855, was designated a land grant college. It is supported by Federal and State appropriations. In the intervening years it has grown so large and organized so many departments that a committee of the General Assembly has been appointed to consider changing its charter from that of a college to that of a university. Its plant has been enlarged with the completion in 1939 of five or six new buildings. It is co-educational and gives instruction to about 7,000 students with a faculty of 731. In addition to appropriations for the support of the State college appropriations are also made to the University of Pennsylvania, the University of Pittsburgh, Temple university, Jefferson Medical college, Hahnemann Medical college and the Woman's Medical college. There are in the State all told 56 colleges and universities, as well as 14 State teachers colleges and training schools. In addition there are 9,568 elementary schools with 1,258,619 pupils and 1,261 high schools with 651,128 pupils.

Banking and Finance.—On Oct. 2, 1939, there were 510 financial institutions in the State under the supervision of the Department of Banking, exclusive of 144 National banks with trust departments. The total resources of the State institutions on that date were \$3,193,895,975.93. The capital of the 510 banks was \$117,167,640.74 in common stock and \$24,637,379.67 in preferred stock. There were 3,786,912 depositors. The State institutions administered trust funds amounting to \$5,007,885,311.36. On June 30, 1939, there were in the State 694 National banks with a total capital of \$166,537,000, deposits of \$2,851,323,000 and assets of \$3,313,834,000. The estimated revenues of the State for the biennium of 1939-41 were \$376,519,000. Deducting the deficit on May 31, 1939, of \$49,767,867 there remained available for appropriation \$326,751,133. Of this amount \$326,750,352 was appropriated.

Agriculture, Manufactures and Mineral Production.—According to the latest agricultural census there are in the State 191,284 farms with an acreage of 15,855,343. The value of the land and buildings is \$861,706,599. The value of livestock, horses, cattle, mules, sheep and swine on Jan. 1, 1939, was \$143,837,000. The value of field crops for 1938 was \$11,431,800. The cash income from livestock and livestock products was \$190,145,000. The latest industrial statistics show that when compiled there were 17,947 establishments with an invested capital of \$4,339,415,500 employing 1,284,439 persons to whom \$1,145,400,200 was paid in wages. In addition there were 173,743 persons on salary, including officers and office employees, to whom \$381,247,400 was paid. The value of the output was \$6,583,979,900. The metal and mineral products were valued at \$3,058,279,700; food and kindred products, \$770,319,200; mine and quarry products, \$446,197,300; textiles, \$819,402,500; paper and printing industries, \$340,436,600; and tobacco and its products \$35,513,300.

Highways.—On May 31, 1939, there were approximately 99,000mi. of public highways, including 47,000mi. of second class township roads. There were 40,498mi. classified as State highways of which 30,675mi. were surfaced and improved. Of these roads 8,200mi. were concrete or other rigid pavement, and 20,555mi. with a bituminous surface. During the biennium ending May 31,

1939, the period for which appropriations are made, the Department of Highways spent \$159,040,753.18 in addition to large amounts spent by cities, boroughs, townships and counties on highways exclusively under their control. (G. W. Do.)

Pennsylvania, University of, opened its 1939-40 session with an enrolment of approximately 15,970 and a faculty of approximately 1,678. Dr. George W. McClelland, vice-president in charge of undergraduate schools, became provost, vice Dr. Josiah H. Penniman, who retired. William H. DuBarry, director of scholarships and student finance, became vice-president—assistant to the president. Dr. Paul H. Musser, dean of the college, became administrative vice-president, vice George A. Brakeley, who resigned to become financial vice-president of Princeton university. Dr. William E. Lingelbach, professor of modern European history, became dean of the college. Dr. A. Newton Richards, professor of pharmacology, became vice-president in charge of medical affairs, vice Dr. Alfred Stengel, deceased. John B. Thayer, university trustee, became treasurer of the university, vice F. Corlies Morgan, deceased. Dr. Arnold K. Henry, director of admissions, became dean of student affairs.

During 1940 educational institutions and eminent scholars in America and abroad will join the university in celebrating the 200th anniversary of its founding. An electrostatic generator was erected to further the research activities of the department of physics. Plans were completed for the addition to the university hospital of the Dulles and Agnew pavilions, which will contain 190 beds for patients, an X-ray department, operating rooms and research laboratories. The university museum conducted field expeditions in Iran, Cyprus, Armenia and Guatemala. There is continued activity in research throughout the 13 schools and affiliated divisions. (T. S. G.)

Pension, Old Age: see ELECTIONS; INITIATIVE AND REFERENDUM; LEGISLATION, FEDERAL; NEW ZEALAND, DOMINION OF; SOCIAL SECURITY; UNITED STATES. See also under various States.

Pension, Soldiers': see VETERANS' ADMINISTRATION.

Pepper: see SPICES.

Perfumes: see SOAP, PERFUMERY AND COSMETICS.

Perim: see ADEN.

Permanent Court of International Justice.

The court was not very active during the year 1939, for only three cases came before it for decision. The year was also marked by a withdrawal from the obligations of article 36 of the statute (by which States agree to permit themselves to be sued without their express consent in each case) by Great Britain and other belligerents. In 1939 also a new election of judges should have taken place. But owing to the war in Europe the assembly and council of the League did not meet for this purpose but, by resolution, extended the tenure of the existing judges, under article 13.

In the Panevezys-Saldutiskis railway case, decided Feb. 28, 1939, Estonia sued Lithuania as the alleged successor in interest of a pre-1917 Russian railroad corporation, part of whose lines lay in each of the successor's States along the Baltic. Estonia based her claim on a treaty of 1920 with Soviet Russia which purported to grant rights over the Lithuanian part of the line, now reorganized as the Esimene company. Lithuania declined to recognize Estonia's right of succession or the Esimene company's title.

The court decided ten to four that the Lithuanian objections were well founded, that the injury, if any, was done to a Russian corporation at its origin.

A second case involved a suit by Belgium against Bulgaria

arising out of a dispute as to the application of an award of the Mixed Arbitral Tribunal established under the Treaty of Neuilly. That Tribunal had decided that a Belgian electric company in Sofia was entitled to restitution of its property seized by Bulgaria and a modification of its concession. Points in dispute were the price to be paid for coal and the exchange rate to be applied to Belgian francs, such francs having depreciated in 1935, and the amount of taxes due to the city of Sofia. Meanwhile the city of Sofia had brought its own action in Bulgarian courts. While appeal was pending to the highest court, a new income tax was decreed. Belgium then suggested international arbitration under a 1931 treaty with Bulgaria. The majority of the court, 9 to 5, decided in favour of Bulgaria, holding among other matters that the 1931 treaty could not defeat jurisdiction of the Permanent Court.

In the case of *Société Commerciale de Belgique* (Belgium) v. *Greece*, the claimant company was to be paid in bonds for the construction of railroads, such bonds to constitute part of the public debt (on which Greece defaulted in 1932). The court decided 13 to 2 in favour of Belgium.

The withdrawals by Great Britain, the Dominions and France from article 36 of the statute insofar as concerns questions arising in the course of the European war were explained by the statement that when the optional clause was signed it was assumed that article 16 of the Covenant would be carried out but that various nations had indicated their unwillingness to execute the Covenant, had in fact declared their neutrality in the war, and that hence Great Britain and the Dominions felt that conditions had changed and that it was inappropriate to permit article 36 to be applied to questions arising out of the European war. Greece, on the other hand, renewed its acceptance of the optional clause for a further period of five years with certain reservations. The Moslem countries, Egypt, Turkey, Iran and Iraq, petitioned the League for a jurist representing Moslem law. Liechtenstein appealed to the court against a decision of the Royal Curia of Hungary in 1932 in matters affecting Felix Gersichy.

The outbreak of the war in 1939 and the removal of questions of belligerent and neutral rights from the jurisdiction of the court may further reduce the business of the court in the period immediately ahead.

(See also INTERNATIONAL LAW; LEAGUE OF NATIONS.)

Persia: see IRAN.

Peru, a republic on the west coast of South America; language, Spanish; capital, Lima; president, Dr. Manuel Prado y Ugarteche; the area, including some 100,000 sq.mi. of territory disputed with Ecuador, is officially estimated at 532,185 square miles. No census has been taken since 1876, but preparations were under way during 1939 to effect a complete census of the country early in 1940. Population estimates range from 6,600,000 to as high as 10,000,000.

The chief cities are: Lima, 650,000; Callao, 120,000; Arequipa, 100,000; Cuzco, 80,000; Trujillo, 70,000; Chiclayo, 50,000; Iquitos, 40,000.

History.—The most significant event in Peru during 1939 was the voluntary retirement of General Oscar R. Benavides, president and dictator since 1933, and the election of Dr. Manuel Prado y Ugarteche, in October, to succeed him. Dr. Prado, first civilian president in ten years, was inaugurated on December 8. Retirement of General Benavides had been forecast as early as February, when his minister of the interior, General Antonio Rodríguez, was killed in an abortive attempt to seize the presidency. President Prado pledged a "middle of the road" and democratic policy, but indications at the end of the year were that only mild and gradual modifications of the stringent Benavides policies

would be effected, as an estimated 800 to 1,000 political prisoners continued in prison, and many opponents of Benavides remained in exile.

Development of public works, a feature of the Benavides regime, was continued through 1939, with emphasis on highway and port construction. Five workers' housing projects were in process of completion in Lima, bringing the total there to ten. An extensive hospital building program was under way as part of the national obligatory social insurance plan. In Dec. 1939, the new Palace of Justice, one of South America's largest buildings, was completed.

In September, upon the outbreak of the European war, Peru declared strict neutrality. To ease the economic dislocation caused by the war, decrees were issued against profiteering.

Education.—Peru had 5,826 elementary schools, with 10,615 teachers and 683,201 pupils, in 1939, a marked advance since 1933, when there were 3,714 schools, 6,624 teachers and 367,404 pupils. Secondary schools totalled 216, in addition to technical schools of agriculture, animal husbandry and forestry. The five universities include the University of San Marcos at Lima, oldest in America.

Finance.—The monetary unit is the sol (value: approximately 17 cents U.S.).

Trade and Communication.—Peru has good sea communications and excellent air transport service to foreign countries, supplemented by rail connections with Bolivia and northern Chile. There are around 2,600mi. of railways and a well developed interior air service. The highway system, 25,000km. in extent, includes 13,659km. of asphalted roads. During 1939 the Lima-Arequipa section of the Inter-American highway, 1,200km. in length, was opened to traffic, and the highway linking Lima with the Amazon basin across the 16,000-ft. Continental Divide (said to be the highest improved road in the world) was carried as far as Pucallpa in eastern Peru.

Peru's imports are mainly foodstuffs and miscellaneous manufactured goods. Exports are largely petroleum, cotton, metals and sugar. In 1938 imports aggregated 260,159,000 soles in value, a 10.6% increase over 1937, and were derived principally from the United States (34.3%), Germany (20.6%) and Great Britain (10.1%). Exports for 1938 declined 6.8%, after six years of steady increase, and totalled 342,128,000 soles (United States, 26.8%; Great Britain, 19.9%; Germany, 10.5%). During the first eight months of 1939 imports were 165,651,640 soles (a 2% drop), and exports 242,667,405 soles (a 19% gain). Heavy declines in both were registered in the last four months, due to European war conditions.

Agriculture, Mineral Production.—In 1937, 1,463,867 hectares (approximately 3,500,000ac.) were under intensive agriculture. The chief agricultural products are: cotton, cane sugar, rice, tobacco, coffee, corn, coca and vegetable ivory. In 1938, 69,565 tons of cotton and 260,182 tons of sugar were exported. Guano (1938 production: 320,000 tons) is likewise an important product. Peru is second in petroleum production in South America and tenth in the world (17,000,000bbl. annually), and leads the world in vanadium and bismuth production. Silver, gold, copper, tungsten, lead, antimony, zinc and other minerals are produced in quantity.

(L. W. BE; M. L. M.)

Pests, Agricultural: see ENTOMOLOGY.

Petrol: see GASOLINE; PETROLEUM.

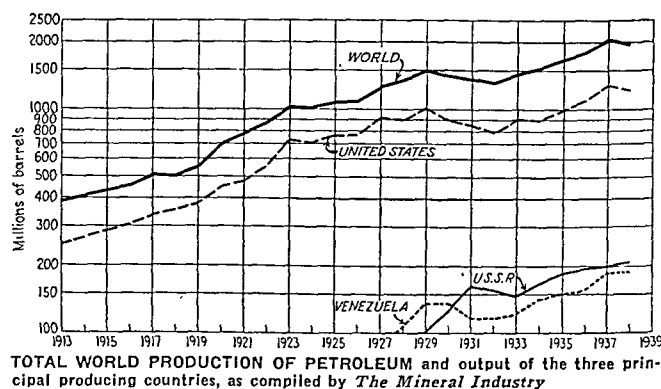
Petroleum. The outstanding event of 1939 affecting world petroleum was, of course, the war in Europe. Petroleum is a war essential of major importance. Armies and navies of warring countries must have assured and increasing

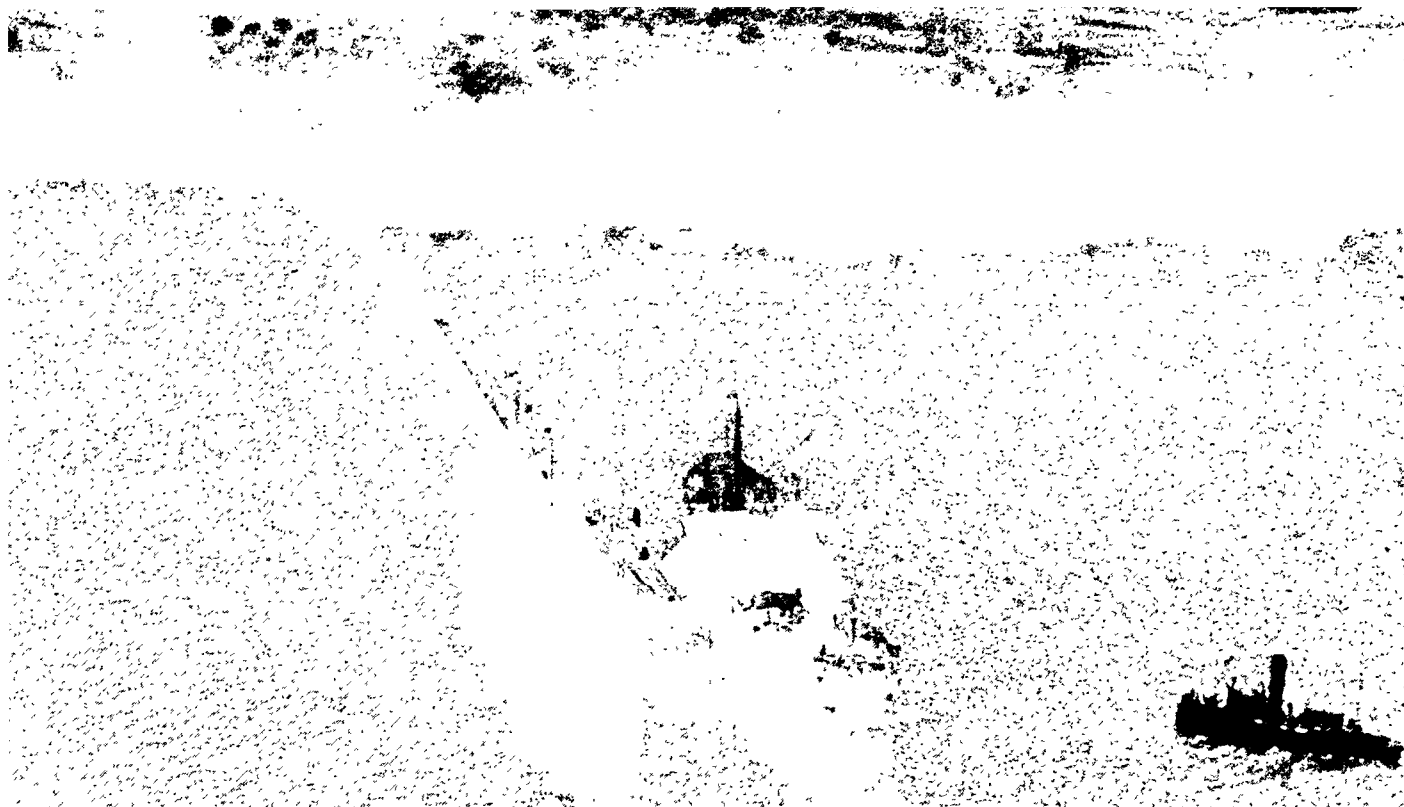
supplies of motor fuel, aviation gasoline and fuel oil. Manufacture and transportation dealing with materials and products entering directly or indirectly into war usage also demand increasing petroleum requirements in war-time. To offset this accelerated demand, civilian or non-military consumption of petroleum products is restricted. For instance, in Germany, France and England, in all belligerent countries and even in some neutral European countries, civilian use of gasoline in motor cars either is wholly or partially banned.

Petroleum products are listed as contraband by all belligerents. The economic blockade of Germany by the Allies has cut Germany off from the petroleum sources normally available to her by sea transportation, such as the United States, Mexico and South America. At the same time, tankers bringing petroleum to the British Isles are a special target of U-boats in Germany's own blockade of her enemies. Great Britain, France and Germany each have but an insignificant home production of petroleum and each are dependent upon outside sources for petroleum supplies. Whereas a completely effective sea blockade by Germany would cut off all outside supplies from Great Britain and France—a not likely possibility—the Allied blockade cannot stop Germany from getting petroleum from the principal oil-producing countries of Europe. In her conquest of Poland, Germany has acquired the Galician oil fields; she normally imports about 25% of Rumania's production of petroleum products, and she has as a friend Russia, the second largest oil producing country in the world.

But Russia, despite her high ranking, produces only 10.23% of the world's petroleum; Rumania but 2.44% and Poland but .19%. The Allies, on the other hand, if they can keep their own sea lanes open, theoretically, at least, can draw upon close to 87% of the world's petroleum production. They have open to them the United States producing 61% of the world's petroleum; Venezuela and other South American oil sources, as well as the great producing areas of Iran, Iraq, India and the East Indies which they have greatly developed in recent years. The principal problem of the Allies is one of transportation. The British have a large and adequate tanker fleet.

Authorities estimate that Germany's war-time petroleum requirements run at the rate of 75,000,000 to 89,000,000bbl. annually, whereas her own production of petroleum, Poland's entire production and Germany's imports of Rumanian oil amount to only something over 30,000,000 barrels. Added to that is Germany's production of synthetic gasoline from coal and lignite, unofficially estimated at 12,750,000bbl. in 1938, a five-fold increase over 1933. How much Russian oil is available to Germany is problematical, as normally Russia produces not much more than enough for her own needs and with herself engaged in war those needs would be aggravated. Also transportation of Russian oil to Germany is no easy matter. While it would seem Germany's position in the matter of petroleum supplies is far from com-





THE FIRST OIL BEGAN TO FLOW early in Nov. 1939 from the huge Barco concession in Colombia through a 263-mi. pipe-line to the sea at Coveñas, where it was loaded into U.S. tankers

portable, it cannot be called serious at this stage of the war, inasmuch as Germany long has been accumulating a petroleum reserve, estimated between 35,000,000 and 40,000,000 bbl., and also is greatly expanding her output of synthetic gasoline. Near Stettin, in north-eastern Germany, she is building the largest synthetic gasoline plant in the world to convert oil residues and coal from Silesian mines into motor fuel. This plant will be larger than her Leuna plant, with a capacity of about 3,000,000 bbl. annually. Initial output will begin about the middle of 1940 and the entire plant will be completed the following year.

If Germany built up large oil reserves, the same probably is true with respect to England and France. In view of this, together with the fact that the outside sources of all belligerents have not been completely severed, the immediate position of all major warring countries with respect to petroleum would not seem to be critical. The effectiveness of blockades and of transportation will tell the story, and a long-drawn-out war may mean a changing picture wherein petroleum will be the decisive instrument of the war.

After the World War it was said by Lord Curzon that the Allies "floated to victory on a flood of oil." That flood came chiefly from the United States and Mexico. The dependence of Europe upon American oil is proportionately smaller today than back in 1914-18, because of the development of Iraq, Iran and East Indian oil fields, but quantitatively it continues to be enormous. Also America has a great tanker fleet. Under the present Neutrality Act, American tankers cannot ply in belligerent waters. A few American tankers were transferred to Panama registry, but it still has to be clarified (Jan. 1, 1940) whether transfer of American ships to foreign registry will be permitted as a general policy. Oct. 1939, exports (latest available figures) of gas oil and fuel oil and of motor fuel from the United States showed a considerable increase over the corresponding month of 1938, but the 10-months' figures for these and other petroleum were lower. It is reasonable to expect that there will be greatly increased demand on the part

of the Allies for United States and South American oil, depending upon the availability of tanker tonnage.

Japan is a heavy buyer of United States oil, particularly California oil. Despite the fact that Russia is considered self-sufficient with respect to oil, approximately 1,000,000 bbl. of low-grade gasoline was shipped from California to Vladivostok in 11 tankers between Aug. and Oct. 1939. During the regular session of Congress in 1939 Japan's aggression in China caused a resolution to be introduced in the Senate for an embargo on petroleum products, scrap iron and other materials to Japan, but was not acted upon as it was pointed out that such an act would be in violation of a trade treaty with Japan, expiring Jan. 26, 1940. What the fate of this treaty will be when it comes up for renewal is not known at the present time (Jan. 1, 1940). President Roosevelt's declaration for a "moral embargo" on Russia, following the Soviet Government's invasion of Finland, may stop further American oil sales to Russia. America tried "moral suasion" to shut off oil shipments to Italy when she invaded Ethiopia.

The European war had an immediate repercussion in Mexico, the Government of which in 1938 had expropriated all foreign oil properties for Government operation, and in 1939 had contracted to sell Germany oil in exchange for oil well machinery and other supplies. As a result of the expropriation of British, Dutch and American properties and the actual or virtual banning of oil trade to those countries, Mexico had sought a market for her oil in other quarters. The war and the blockade of Germany deprived her of her principal customer. Mexican Government representatives then sought to reopen oil trade with the United States. Formal action was taken at the annual meeting of the American Petroleum Institute asking the United States Government to ban the shipment of Mexican oil into the United States. Late in 1939 the Mexican Supreme Court sustained the Mexican Government's seizure of American, British and Dutch-owned oil properties. Diplomatic representations for the return of the properties continued in 1939. The Mexican Federal Court in December issued citations to all expropriated oil companies calling on them to appoint experts to confer with Government experts for the purpose of estab-

lishing the value of the expropriated properties, or in other words the amount of compensation the Government should pay the companies. The companies were considering their attitude; the general opinion being that they would not comply lest this action imply acceptance on their part of a *fait accompli* of expropriation.

A reciprocal trade agreement between the United States and Venezuela announced by Secretary of State Hull, cutting in half the excise tax of 21¢ per barrel on U.S. imports of Venezuelan crude and fuel oil and made provisionally effective Dec. 16, 1939, drew fire from the American petroleum industry. The excise tax was established at the insistence of American oil producers in the Mid-Continent field who demanded protection against the flood of Venezuelan and Mexican oil.

While the dislocation and readjustment necessitated by the European war has been the chief occupation of the American oil industry, domestic problems having to do with control of production continued to be acute. In Aug. 1939 there was a two-weeks' shut down of production in Texas initiated as a protest against declining price. Agitation continued for Federal control, instead of the present decentralized regulation by State authority and common council under the Interstate Oil Compact plan. Hearings on the Cole bill for Federal control were held. In October President Roosevelt once more endorsed the principle of controlling America's oil production through State compacts, and did much to allay fear of passage of sweeping Federal control legislation by the 1940 Congress. One of the chief criticisms against State compact regulation is that all oil producing States are not members of the compact, notably California and Illinois. California regulates its production voluntarily. Illinois became an important oil producing State only within the last year, and, under competitive drilling, has consistently produced above the estimated demand. In 1939 Nebraska became an oil producing State for the first time with a well near Falls City having a reported potential production of around 150 barrels. Test wells in Missouri, Iowa and Mississippi indicate that other new States will come into production soon, with the usual result of unrestricted, competitive drilling. States just opening up oil production are reluctant to pass regulatory measures restricting such production. This situation may furnish more ammunition for those who believe that only by Federal regulation can production in the United States be adequately held under control. The question of control may become more pronounced as the European war continues and assuming that there is heavy drain on American oil sources by European belligerents. In the meantime the war has tended to speed production and refinery developments in the United States. (See also FULLER'S EARTH; ILLINOIS: *Oil*; MEXICO: *History*.)

BIBLIOGRAPHY.—Trade Publications: *Oil and Gas Journal*, *National Petroleum News*, *Oil Weekly*. See also bulletins and proceedings American Petroleum Institute; B. M. McConnell, *Mexico at the Bar of Public Opinion* (1939). (L. M. F.)

Petrology: see GEOLOGY: *Petrology*.

"Phenix": see FRANCE: *History*.

Philadelphia, third largest city of the United States (pop., 1,972,700, census estimate 1933) suffered the loss of its mayor, S. Davis Wilson, by death (August 19), and from the lack of a leader in its city hall, for the eight months in 1939 its chief magistrate was ill. Under the City Charter, George Connell, President of City Council, took over the mayor's duties after Mr. Wilson notified him (August 11), he was "temporarily freeing" himself in order to hasten his recovery.

The year 1939 will be remembered as the one which passed two budgets. On August 10, the budget for 1939 was passed, eight months after the legal time; and on December 15, that for 1940 was passed, and the announcement made that it was balanced. It

totalled \$82,386,461.40. The budget for 1939 was \$112,087,904, the largest in the city's history. In order to clear up the debt which had tangled the city's finances, on August 1 the city "sold" its gas rentals to a syndicate for the next 12½ to 18 years, for \$41,000,000.

At the November election, Judge Robert E. Lamberton was chosen mayor, and immediately he recommended to City Council some vast changes in the city's budget, suggesting many economies in personnel, streamlining the police and fire departments; proposing needed modern apparatus for the latter; suggesting early retirement age for police and firemen, and placing both in two classes, the younger receiving higher pay.

On December 13, City Council in a new effort to keep the budget balanced, passed a tax of 1½% on all wages. A 3% sales tax was defeated earlier in the year, as was a 1½% income tax.

After five years of litigation, November 14, the Federal Court put a final O.K. on a reorganization plan for the city's transit system, which was scheduled to go into effect on Jan. 1, 1940. This plan will unify the Philadelphia Rapid Transit Company, under a single operating corporation, and is designed to save the company millions of dollars in overhead expenses, and make possible an extensive program for improving the service by the addition of hundreds of modern trolley cars, buses, and trackless cars. The most surprising feature of the plan for the new Philadelphia Transportation Company, has been the elimination of the underliers, whose rentals took \$9,000,000 a year out of the transit system's treasury. The new company is to be capitalized at \$85,000,000. U.S. District Court Judge George A. Welsh, who approved the plan, said the work "cannot be equalled in legal annals." (J. JAC.)

Philately. The year 1939 marked the close of the first century of postage stamps. The outbreak of the war in Europe forced cancellation of the Centenary exhibition that was scheduled for May 6, 1940, in London. During the year, there were issued 2,345 new stamps, of which 1,574 were for purely postal purposes, including commemoratives, 341 airmail stamps, 255 semi-postal (for charitable or extra-official purposes as well as postage) and the remaining for various services, such as postage due, special delivery, official mail, registry, etc.

The War.—The first issue from the war-zone was a surcharged lot from Danzig, announcing its "freedom." Special issues for Moravia and Bohemia, Slovakia and the Carpatho-Ukraine districts were undoubtedly under way before the war, but appeared in increased number after the mobilization. What has happened to the Polish stamps is unknown, as no mail is coming out from the occupied districts.

Commemoratives.—The United States issued the usual run of commemoratives. The World's Fairs at San Francisco and New York each received a single three-cent value; the centenary of baseball received a surprise acknowledgement of a similar value portraying a sandlot game; the sesquicentenary of the inauguration of Washington as president was commemorated and the 25th anniversary of the Panama canal was recognized in a three-cent issue. The Canal Zone issued a full set of commemoratives for this latter anniversary. Establishment of the printing press in America and the statehood of four States—the Dakotas, Montana, and Idaho all on one stamp—were likewise remembered.

Inauguration of transatlantic mail brought a new United States airmail stamp, a 30¢ value to cover the single-letter rate for that service.

The World's Fairs stimulated a number of foreign Governments to "commemorate" activities of the United States. For San Francisco, Salvador issued a modest three-stamp set, while Ecuador produced two sets of seven each (airmail and regular postage).

Nicaragua issued one set of seven for both fairs. For New York, France issued one stamp and a set of postcards, while 26 French colonies each issued two, and Algeria four. Seven Portuguese colonies each issued a single stamp, and Portuguese India issued two. Iceland had a set of three and a souvenir sheet; Ecuador two sets and the Dominican Republic a set of five; Brazil four; Mexico five; Rumania and Russia two each; the Netherlands and Poland, one each. Czecho-Slovakia, which had constructed a pavilion before partition, helped finance it by selling specially overprinted souvenir sheets. Mexico commemorated the World-Wide Philatelists convention at Tulsa, Oklahoma, with a stamp, and Nicaragua paid tribute to Will Rogers with a short set. China and Turkey also issued sets for the sesquicentenary of the U.S. Constitution, the Turkish set also paying tribute to the New York World's Fair.

Among the many commemoratives issued during 1939, the attractive set of three bi-coloured stamps by Canada for the visit of George VI and Elizabeth was outstanding.

The Republic of Hatay, formerly the Sanjak of Alexandretta, lived long enough to issue two sets of stamps before becoming a part of Turkey.

The philatelic truck of the United States Post Office Department visited New England and the North Atlantic States in 1939, heading southward in the fall. An interesting souvenir of its visit, obtainable only by actually entering the truck, is an engraved picture of the White House, printed on the small press that is part of the exhibit. The department has asked an appropriation for more of these trucks, which show the various issues of U.S. stamps as well as the methods of stamp-production.

"Heroes of Peace" Issue.—During 1939, the United States Post Office Department announced the long-discussed "Heroes of Peace" issues. There will be seven series, each having five stamps of 1¢, 1½¢, 2¢, 3¢ and 5¢ values. The series are devoted to American authors, poets, artists, educators, inventors, composers and scientists. Those who have been chosen to represent these classifications are: Authors—Ralph Waldo Emerson, Samuel L. Clemens (Mark Twain), Washington Irving, Louisa May Alcott, James Fenimore Cooper; Poets—Henry W. Longfellow, James Whitcomb Riley, Walt Whitman, John Greenleaf Whittier, James Russell Lowell; Artists—James Abbott McNeill Whistler, Daniel Chester French, Augustus Saint-Gaudens, Frederic Remington, Gilbert Charles Stuart; Educators—Horace Mann, Charles W. Eliot, Booker T. Washington (the first Negro to appear on a U.S. stamp), Frances E. Willard, Mark Hopkins; Inventors—Alexander Graham Bell, Eli Whitney, Samuel F. B. Morse, Elias Howe, Cyrus H. McCormick; Composers—John Philip Sousa, Edward A. MacDowell, Stephen Collins Foster, Victor Herbert, Ethelbert Nevin; Scientists—Luther Burbank, Dr. Crawford W. Long, Dr. Walter Reed, John James Audubon, Jane Addams. The new series will appear in 1940.

Literature.—Scott's Standard catalogue signalized the second century of stamps by a change in its make-up for the 1940 issue—which appeared in Sept. 1939. The main change is a rearrangement of the numbering. All special-usage stamps, including semi-postal, registrations, special delivery, parcel post, occupation, official, postage due, offices abroad, airmail and the like, are given prefixes of letters in the numerical listing. Following the lead of Stanley Gibbons' (British) Catalogue, the new edition differentiates between two hitherto interchangeable words—"surcharge" and "overprint." It also begins the practice of indicating the method of production of the stamps—printing, typography, or lithography—and the manufacturer.

Exchange of stamps between countries, which has always had a certain amount of complication because of exchange and duties, was simplified by the United States with the removal of the "cus-

toms fee" on Aug. 1, 1939, formerly assessed on duty-free packets of stamps. However, in Germany, previous to hostilities, even simple exchanges between collectors had to pass through a central office, to prevent fictitious exchanges to create foreign balances.

Personnel.—The death of Major Guy W. A. Camp of Indiana, former president of the Society of Philatelic Americans, was a serious loss to philately in 1939. The Crawford Medal, awarded annually by the Royal Philatelic Society of London, again went to an American—Max Johl of New York—for his series of books on the 20th century issues of the United States, which he initiated some years ago with the late Beverly King. (M. HA.)

Philippines, Commonwealth of the.

The Philippine islands, over 7,000 in number, south-east of China, entirely in the tropics; capital, Manila; U.S. high commissioner, Paul V. McNutt (until July 1939), Francis B. Sayre; president, Manuel Quezon; vice-president, Sergio Osmeña; resident commissioner at Washington, Joaquín Miguel Elizalde, who replaced Quintín Paredes; status in 1939, that of an unincorporated territory, until July 4, 1946, under constitution provided in the Tydings-McDuffie Independence Act; national assembly, unicameral. During the period of the commonwealth, all legislation affecting currency, coinage, imports, exports and immigration requires approval of the President of the United States; the U.S. is in control of foreign affairs; and all decisions of local courts are subject to review by U.S. Supreme Court. Area, approximately 114,400 square miles. The 1939 census showed a population of 15,984,247 as against 10,314,310 in 1918 and 7,635,426 in 1903. The earliest (1794) figures were 1,502,574. Only two complete Spanish censuses (1877 and 1887) were taken. The annual immigration quota (now reduced to 50) to the United States was filled by April 28, and no further visas were issued to non-preference applicants; while it was expected that the preferential quota would be exhausted during the fiscal year 1938-39.

History.—The first regular session of the second Commonwealth legislature (now unicameral) closed on May 18, 1939, with 170 bills passed. Meanwhile a movement, whose objective is expressed by the phrase "continue the commonwealth," had been promoted by certain Filipino groups, including land owners, merchants and even labourers, but whose numerical strength has yet to be disclosed. One of them, the Commonwealth Assn. Inc., reported 3,000 members by May, in central Luzon and the Visayas. A delegation from another group called on President Quezon, August 30; among them was labour leader Esteban Vazquez who declared "over and above independence we love liberty." The president was reported as listening attentively and remarking that "not all who talk of independence are the real patriots." Former High Commissioner McNutt, who resigned in July, has stated publicly that the Filipino leaders "were agreed that complete independence is not possible under present Far East conditions and have altered their position accordingly"; but a mildly phrased resolution, with a similar trend, drew only seven votes in the legislature, as against 53. Among the measures enacted were one for an "Agricultural and Industrial Bank"; a Naturalization Act, removing restrictions against orientals, but requiring knowledge of English, Spanish or a native dialect; various acts relating to public lands, including one for the reopening of judicial proceeding affecting them; but proposals for constitutional amendments to revive the bicameral legislative system and to change the presidential term to four years, permitting re-election, were postponed. President Quezon has expressed himself differently on several occasions, as regards the second of these proposals; his leading opponent, Gen. Aguinaldo, opposes all constitutional amendments "for the present."

Serious agrarian troubles marked the early part of 1939 in central Luzon, between landlords and peon tenants. In Pampanga province during March an encounter of 500 of the latter with vigilantes (special police) sent to maintain order, resulted in injuries to 20 of the striking tenants. On May 9 President Quezon placed two municipalities under constabulary control and later went to his own Pampanga hacienda and made a speech of appeasement to his tenants. In Bulacan province, the tenants organized under Juan Rustia, local lawyer, and refused to pay rent, denying the alleged landlord's claim to ownership. Rustia likewise represents two Bulacan municipalities claiming title, in behalf of their inhabitants, to nearly 70,000 ac. of land which, they allege, was wrongfully appropriated by representatives of the dominant church. The case is now pending in the United States Supreme Court. In Nueva Ecija province, during August, strikes were called by both tenants and public works labourers. The unification of Filipino labour under a single governing unit had been announced on May 16.

At the trial in Aug. 1939 of Benigno Ramos, for sedition in leading the "Sakdal" uprising in 1935, a letter, purporting to have been written by him from Japan, where he had taken refuge, was introduced by the prosecution. It directed his followers to capture Governor-General Murphy, the archbishop of Manila "and other Americans," annihilate the constabulary and burn the "entire city of Manila." Ramos' followers are estimated at 100,000 and he had announced his candidacy for president to succeed Quezon. He is also said to have given the assurance that "the Japanese are willing to help." Fear of Japan's designs is growing; for the Philippines lie in the direct path of the former's expansion southward to the East Indies, believed to form a part of Japan's "new order in Asia," which includes the expulsion of all Western powers, leaving Japan in full control.

On July 26, Francis B. Sayre, assistant secretary of State was appointed to succeed High Commissioner McNutt and sailed for his post in September. He had been active in securing tariff legislation which the Filipinos desired and was warmly welcomed in Manila. The Bureau of Insular Affairs which, since its establishment early in the century, had been the liaison agency between the Federal and Philippine Governments, functioning under the War Department was transferred to the Interior by the President's second Reorganization Order and now becomes a section of the Territorial Division.

Education.—Because the Filipinos are a congeries of many distinct groups, each with a distinct language or dialect (there are as many as 55 languages and many more dialects) they have no common native language. When the U.S. Government launched its great educational project there at the turn of the century, one of its chief objectives was to give them a common language by "making them literate in English." So well did it succeed that a far greater number of Filipinos learned English in the 40 years of American rule than had ever spoken Spanish at any one time during the nearly four centuries of Spain's domination. The Philippine Constitution (XVII, 8) recognized and perpetuated that objective by providing:

"The Government of the Commonwealth of the Philippines shall establish and maintain an adequate system of public schools, primarily conducted in the English language . . ."

It was, therefore, a distinct surprise for the many Americans who gave their best years to the Philippine educational service, to learn that Jorge Bocobo, the recently appointed secretary of Public Instruction, had given orders to teachers to use the native dialect in each locality as an "auxiliary" medium of primary instruction. This is a reversal of the 40-year plan of teaching the Filipino child English from the start and using it alone as the medium for instruction in all subjects. The result of the change will

probably be to prevent the child from ever learning English thoroughly and will certainly tend to perpetuate the dialects, whose elimination is indispensable to the formation of anything approaching "a national language." Mr. Bocobo was educated in the United States, but his highly nationalistic attitude sometimes becomes fantastic—as when he declared publicly that no Filipina (girl) should accept a marriage proposal unless made in her native dialect. Those dialects have no literature worthy of the name and all text-books would need to be translated into them at an enormous expense of time and money, and meanwhile the present generation of school children would wait in vain for even an approach to an education. It is interesting to note, however, that, following defeat in 1938 of the efforts to force religious instruction in the public schools, two prominent Filipinos, both American trained and who had opposed that attempt, were appointed to educational posts in the Philippine Government; Camilo Osias as chairman of a committee to study other educational systems, and Dean Francisco Benitez of the Government university, as director of Private Education, including sectarian schools. A bill to remove the university to a site outside of Manila was passed by the legislature, allegedly on the advice of two American educational advisers, who stressed the larger campus and room for expansion. Critics point out the disadvantages to students working in Manila, many of whom it is feared will be diverted to private institutions within the city, thus lessening the opportunity of the Government university to train the country's future leaders—which was one of the chief objects of its foundation.

Religion.—The Philippines afford a museum—not alone of diverse languages and peoples, but of religions also. The primitive groups, like the Ifugao in north Luzon and the Manobos of the South, are still animistic, believing in spirits and magic, especially witchcraft—a belief likewise retained by many "Christianized" Filipinos. In the great southern island of Mindanao, are thousands of Mohammedans—the results of missions which long antedated the Spaniards. In the lowlands, dominated for over three centuries by Spain, a majority of the population is at least nominally Roman Catholic but Protestant missions have been active since the beginning of the century, the Methodists leading. Contemporaneous with the revolution against the Spanish Government, under which church and State were united, there was a secession movement from the Roman Church, led by Gregorio Aglipay, a former native priest, which assumed formidable proportions and occasioned a large volume of litigation over ecclesiastical property, especially churches, held by the Roman Catholics but claimed by the Aglipayans. The latter's founder, still active, though at an advanced age, was visited early in 1939 by Dr. Louis C. Cornish of Boston, president of the International Association of Liberal Churches who was proclaimed honorary president of the "Independent Philippine Church" (as the Aglipayan body is officially styled) succeeding in that capacity the late William H. Taft. Dr. Cornish describes his experiences in a series of interesting letters to the *Christian Register* (vol. 118). He estimates the present Aglipayan membership at from 2,000,000 to 2,500,000 and to the charge that it "is composed mostly of labourers," he counters, "this is its glory."

Trade and Communication.—In 1938 imports to the Philippines from the United States reached \$90,357,000, being 68% of the total and an increase of 42.5% over those of 1937. The most important item in the gain was cotton piece-goods, displacing imports thereof from Japan, which declined 26%. During the first five months of 1939, imports from all countries declined 44% from the same period of 1938, being \$37,789,458. Exports to the United States from the Philippines reached 85% of all, which amounted to \$55,495,457. For the first five months of 1939 the total exports were \$56,670,390. A House bill passed by the U.S.

Senate on August 3, substitutes quotas, effective 1941-44, but decreasing 5% each year, for the present export taxes on scrap tobacco, cigars, coco-nut oil, sugar, pearl or shell buttons, cordage and embroideries. A joint congressional committee, to sit with a group named by the President, in 1944, will consider and report on future economic and political relations between the United States and the Philippines.

During the first quarter of 1939 Philippine mines yielded \$8,344,725 worth of gold, a gain of 14% over the corresponding period of 1938. In that year the Philippines had attained the sixth place in the production of the baser metals, notably iron. A new tax code, thoroughly revising the Philippine internal revenue system, designed to correct inequalities and to relieve the poorer classes, but nevertheless to produce an additional \$4,500,000 in revenue for the fiscal year, 1939-40, was adopted by the legislature on May 13. For the same period, President Quezon asked \$4,000,000 for public works.

BIBLIOGRAPHY.—W. L. Schurz, *The Manila Galleon* (1938), is an interesting product of 27 years of study of this famous craft, which, for two and one-half centuries, plied between Acapulco and the Philippine capital, affording the sole official link with the governing power, the Philippines being then an adjunct of Mexico. William H. Anderson (40-year resident of the islands), *The Philippine Problem* (1938), traces the history of the American occupation and opposes retention. An unusual amount of space in the periodicals for 1939 was devoted to the Philippines. (C. S. L.)

Philosophy. The violent rupture and resort to arms that marked 1939 had their philosophical aspects. On the one hand was a political and social monism, called the totalitarian state. On the other was the pluralism often associated with democracy. It is easy to over-simplify a conflict of this scope, intellectually as well as emotionally. In this particular conflict an effort to draw philosophical lines of cleavage is likely to be more than usually misleading, since the ideological issues are more than usually confused. The causes of the war, indeed, may well have been more in competitive interests that are not peculiar to the recognized philosophies of either side but reside in the structure of modern industrial and urban life wherever it is found. Nevertheless the war may be said to be very roughly a violent demarcation between the more centralized, tightly organized systems and the empirical, experimental point of view. It is roughly a conflict between authoritarianism and experimentalism.

In the more limited world of philosophical writings several events of importance have taken place. The logical positivists and semanticists have continued their discussions and publications. The New Thomists, particularly through the writings of Mortimer Adler in *The Thomist*, have maintained the fires of their scholastic renewal. The naturalists and the pragmatists, with the great figure of Dewey at their head, have continued their march. A fourth tendency of importance has been the more generalized effort made on various levels to integrate the different fields of human interest and activity. In this centrifugal modern world this effort has a philosophical function, if not always a philosophical terminology.

In this connection the continued publication of the *International Encyclopaedia of United Science* under Neurath is important. Four new volumes, *Principles of the Theory of Probability* by Ernest Nagel, *Foundations of Logic and Mathematics* by Rudolf Carnap, *Linguistic Aspects of Science* by Leonard Bloomfield, and *Theory of Valuations* by John Dewey, continue the emphasis on semantics, positivism, and pragmatism that marked the first year of publication. Two more volumes have been added to a group designed to consider various ideologies, skills, and special knowledges in the light of each other and to find bases for common action. These are *Politics and Public Service* by Leonard D. White and T. V. Smith, and *Agriculture in Modern Life*, by O. E. Baker, Ralph Borsodi and M. L. Wilson. *Geist und*

Sein by Herman Schmalenbach is the first volume of *Philosophia Universalis*, a series by well known European philosophers. *Knowledge for What* by Lynd is a brilliant criticism of the particularism of modern science and research and a demand that value judgments and programs for action be introduced into the disciplines of social science and intellectual life.

Not the least important of 1939's philosophical events is the reception, critical and expository, of Dewey's logic as stated in his theory of inquiry. A pragmatic logic in which logical forms are treated as postulates and logical process as little more than methodology is bound to run afoul both of rationalistic and realistic metaphysics. This conflict is described by Piatt in *The Philosophy of John Dewey*, volume one in *The Library of Living Philosophers* edited by Paul A. Schilpp. In the same volume the logic of Dewey is criticised from a dominantly rationalistic point of view by Bertrand Russell. The pragmatists' thesis, according to Piatt, is, first, that the given is a set of real and recognizable features of the perceptual environment. Inquiry, second, can so control the given as to establish reliable features within it as data or signs for inference to what is not given. If these be true, it follows, third, that we can so modify the perceptual situation given as to reveal what is there apart from the perceiving subject. Meaning from the pragmatic point of view is a functional relationship between things as signs and other things as signified.

This logic founded in behaviour and expressed in the verbally imprecise language of action, pressure, organic change, is sharply criticised by Russell. Dewey's interest in the continuity of any situation, its unbroken movement and change, and his insistence that logic or inquiry has for its purpose not to describe the world but to change it, is analysed by Russell with considerable severity.

The pragmatists' position, he says, is a product of a limited scepticism supplemented by a surprising dogmatism. If Russell's criticism on the face of it has what the pragmatist might call an undue faith in verbal logic, which really is a faith in the correspondence between symbolic processes and the real situation, there is behind his logicisms a deep resistance to Dewey's emphasis on the essential transitiveness or practicality of action. There is in activity, says Russell, peace as well as yearning; there is rest, ecstasy.

Among other philosophical books of the year are Husserl's posthumous *Erfahrung und Urteil: Untersuchungen zur Genealogie der Logik; Language and Reality* by W. M. Urban; *Charles S. Pierce's Empiricism* by J. Buchler. Also may be noted: *The Decline of Mechanism in Modern Physics* by A. D'Abro; *Art is Action* by Baker Brownell; *Types of Religious Philosophy* by E. A. Burt; *Freedom and Culture* by John Dewey; *L'épithymologie* by Jean Urban. (B. B.)

Phoenix Islands: see PACIFIC ISLANDS, BRITISH.

Phosphates. Mineral phosphates, chiefly phosphate rock, a phosphate of calcium, are basic fertilizer material, and as such support an extensive producing industry. A world production of 11,760,000 metric tons in 1930 declined to 6,678,000 tons in 1932, and recovered to 12,025,000 tons in 1938. The United States is the leading producer, with 32% of the total, followed by Tunis 16%, the Soviet Union 15%, French Morocco 12%, Ocean and Nauru islands 10%, Algeria 5%, and Egypt 3%. These seven countries account for 93% of the total, and the remaining 7% is scattered among about 30 others. The general producing area in northern Africa, including Tunis, Morocco and Algeria, has not made any very material recovery from the depression drop. Although both Egypt and Ocean and Nauru islands suffered only a minor decline, and have recovered to a level well

above that of 1930, the Russian output is the only producer which has shown an exceptional growth, increasing steadily from 200,000 tons in 1930 to 1,791,000 tons in 1938. The United States output of 3,989,000 tons in 1930 dropped to 1,734,000 tons in 1932, and rose to 4,019,000 tons in 1937, about one-quarter of which was exported. In 1938 production declined to 3,799,000 tons, but exports increased to 30%. (See also FERTILIZERS.) (G. A. Ro.)

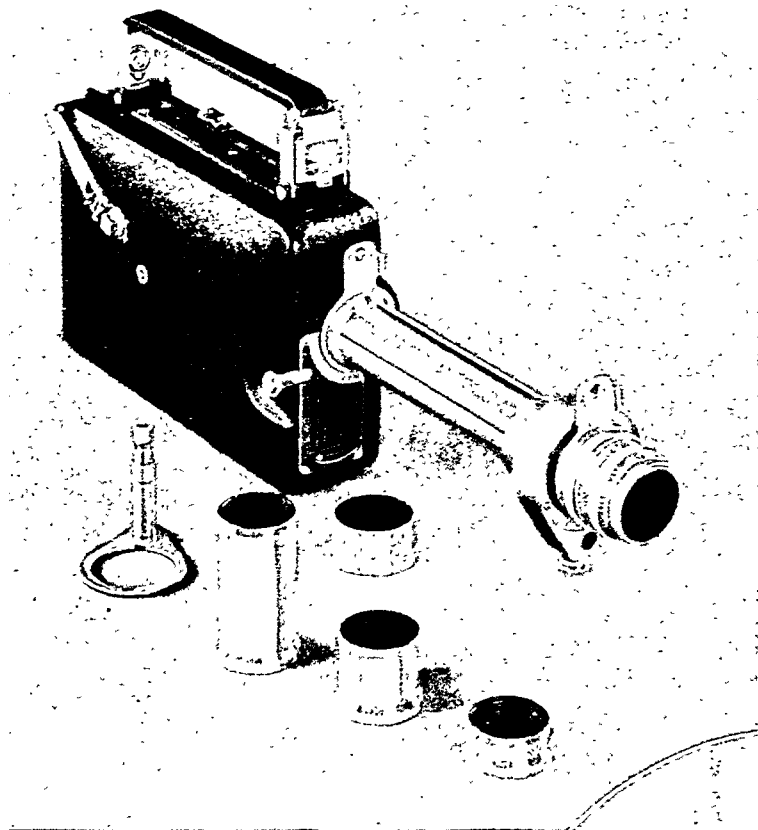
Photography. *General Photography.*—New films of higher speed and increased fineness of grain continue to be introduced. Many new cameras were announced, mostly in the smaller roll film and miniature sizes. In general, there was indication of a tendency to prefer the smaller roll film sizes to the miniature cameras. There was, however, an enormous increase in the use of colour film in miniature cameras. The manufacture of new shutters of precision type was started in the United States. Much attention has been paid to the possibility of increasing the transmission of lenses by treating the glass surfaces to reduce reflections. The interest in fine-grain development, very evident in recent years, declined somewhat, owing to the use of the newer films having high speed and fine grain. Interest in infra-red photography was reflected in the introduction of infra-red sensitive films in cut sheet and roll forms. A new camera was introduced in which a photoelectric cell was incorporated to control automatically the opening of the diaphragm in accordance with the brightness of the subject. A new precision enlarger of extreme flexibility was introduced on the American market. Several new types of flash lamp using foil and wire were introduced, and devices were produced whereby such lamps could be used with the simplest of amateur cameras. Flash lamps were rendered practically non-shatterable by coating with special varnish which, in some cases, included a dye to produce colour correction. Much interest was displayed in the new gaseous discharge lamps containing fluorescent material to fill in gaps in the spectra of the gases in the tube. These lamps showed some promise for broad front lighting, but their introduction in practice appears to be rather slow. The recent publication of patents on the new colour processes using coupler developers resulted in a revival of interest in the use of such developers for producing toned images, the purpose for which they were originally proposed. There was a steady increase in the use of photoelectric types of exposure meter, and meter ratings and speeds were published by one manufacturer for all his materials. An international meeting was held in Munich in June 1939 to discuss the standardization of the measurement and specification of the speed of photographic films. Much progress was made, and agreement on this much-discussed problem is in sight. The American Standards Association Sectional Committee on Photography formed many sub-committees which have started active work on standardization in numerous aspects of photography. The centenary of the discovery of photography by Daguerre was celebrated throughout the world in August, and attracted much public notice. The New York and San Francisco World's Fairs acted as a great stimulus to amateur photography.

Colour Photography.—Colour photography went ahead by leaps and bounds, particularly in the amateur field, but also for commercial illustration using Kodachrome in cut sheet form. An important innovation by the Eastman Kodak Company was a service for supplying duplicates of Kodachrome pictures to the same size as the original and enlarged or reduced, as well as duplicates of 16-mm. motion picture films in colour. Three-colour one-exposure cameras continued to be used for making colour separation negatives for commercial print making by the Carbro and Wash-off Relief processes, and a number of new cameras were introduced. Kodachrome pictures made in miniature cameras were returned from processing ready mounted in the form of

2"x2" slides. This gave a great impetus to the use of such slides for visual education and home projection, and was accompanied by the introduction of cheap models of slide projectors. Colour photography requires that the lamps used in the studio be of the correctly controlled colour, and special incandescent tungsten filament lamps were increasingly used, operating at the colour temperature of 3,200° K., for which cut sheet Kodachrome is balanced. Flash lamps and studio lamps were also made with specially selected blue coatings to permit of their being mixed with daylight for colour photography, and blue glass filters were used over studio lamps to be mixed with arc lights and sunlight. The Eastman Color Temperature Meter was much used for controlling the quality of illumination, in conjunction with special compensating filters. In Europe, colour photography was still carried out almost exclusively by the amateur, using the Kodachrome, Agfacolor-Neu and Dufaycolor processes. In Germany, Agfa demonstrated the Pantochrome process for colour motion picture films, using a lenticular bipack in the camera, and printing on to multicoated "Tripofilm" using the silver-dye bleaching process. Agfa also demonstrated colour films made by the colour negative-positive process. In the United States, the number of films made by the Technicolor process increased. In July 1939 there were nine colour feature films in production, the most under way in any single month, and there was a marked increase in quality. At the Hall of Color in the Kodak building at the New York World's Fair, there were projected changing series of 11 Kodachromes made in miniature cameras, using a continuous screen 22ft. by 187 feet. Special automatic projectors were designed for this unprecedented feat, particular attention being paid to screen illumination, film cooling and accurate registration of adjacent pictures.

Motion Picture Photography.—The industry adopted for studio use the new types of film introduced in the previous year. The extremely fast films extended the possibilities of news-reel work, while for studio operation the films of medium speed were mainly used. Fine-grain duplicating films permitted the preparation of duplicate negatives and positives of improved quality. Improvements were made in incandescent lighting equipment and arcs, and the new fluorescent gaseous discharge lamps were studied for studio use. There was no startling innovation in sound recording, but a steady improvement of quality. Television has not yet reached a stage where it is a serious competitor for the motion picture. Motion picture films were used daily as part of the television programs broadcast by R.C.A. in New York, and the Columbia Broadcasting Company announced a new method of scanning motion pictures for television purposes. A demonstration was given to show the improvement in the viewing of a projected picture obtained by surrounding the screen with an illuminated border of medium brightness. (See also under *Colour Photography*.)

Applications.—Photography continued to serve as a very important tool in the fields of scientific and technical investigation and record, and for education. Colour was increasingly used, particularly in the biological applications, and for illustrating lectures. The great progress in astronomy which has occurred in recent years largely as a result of the introduction of specially sensitized films and plates, was continued, particularly with plates of very high red speed. Through the use of infra-red sensitive materials, new dark stars have been discovered, and the presence of infra-red radiation in space detected. Within six weeks after the 82in. reflector had been put in operation in the new MacDonald Observatory at Mt. Locke, Tex., two new super-heavy stars were discovered. Under the auspices of the National Geographic Society, a program of photography of the aurora was started, and many records were made in both black-and-white and



Above left: GREAT MAGNIFICATION OF SMALL OBJECTS is achieved by this set of lens extension tubes announced in 1939

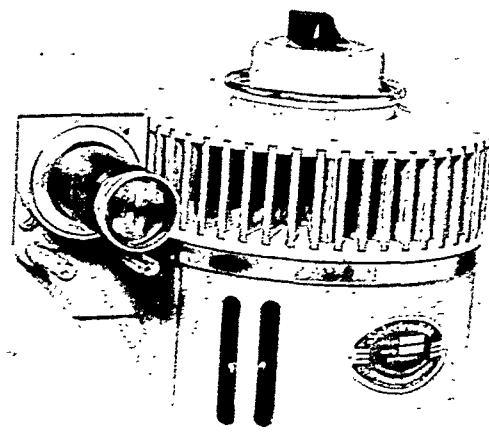
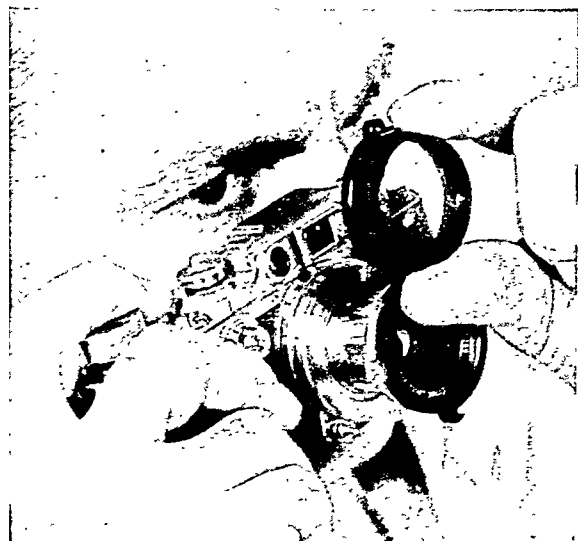
Above right: THIS PRECISION ENLARGER, placed on sale in Sept. 1939, can be used for ordinary prints, lantern slides, colour-separation negatives, copying, titling, or photomicrography

Circle inset: UNBLURRED IMAGE OF A BULLET in flight, photographed with an exposure of one-millionth of a second at the Armour Institute of Technology in Jan. 1939. The camera lens was left open in a dark room, and illumination was provided by a spark gap set off by gases from the firing

Right: PHOTOFLASH OUTFIT mounted on miniature camera by special baseplate

Below left: LIGHT-POLARIZING FILTER, introduced in 1939 for miniature cameras

Below right: THE "SELECTROSLIDE," for continuous automatic projection, was a new product of 1939



colour. High speed photography using the technique developed by Edgerton found many applications in science and industry. By lowering a tiny camera, calibrated scale and compass into oil wells, drillers have developed a way of determining the alignment of the wells underground, and in one case the method has been used to produce deliberate departure from the vertical. In the educational field, there is a slight increase in the use of sub-standard motion pictures, although the interest is not so great in the United States as it is in Europe. There is a great increase in the use of projectors using 2in. square slides, partly due to the new practice of returning Kodachromes from processing ready mounted for projection, and partly to the availability of cheap projectors and simple means for the photographer to mount his own transparencies. In the photomechanical field, there is a marked increase in the use of colour.

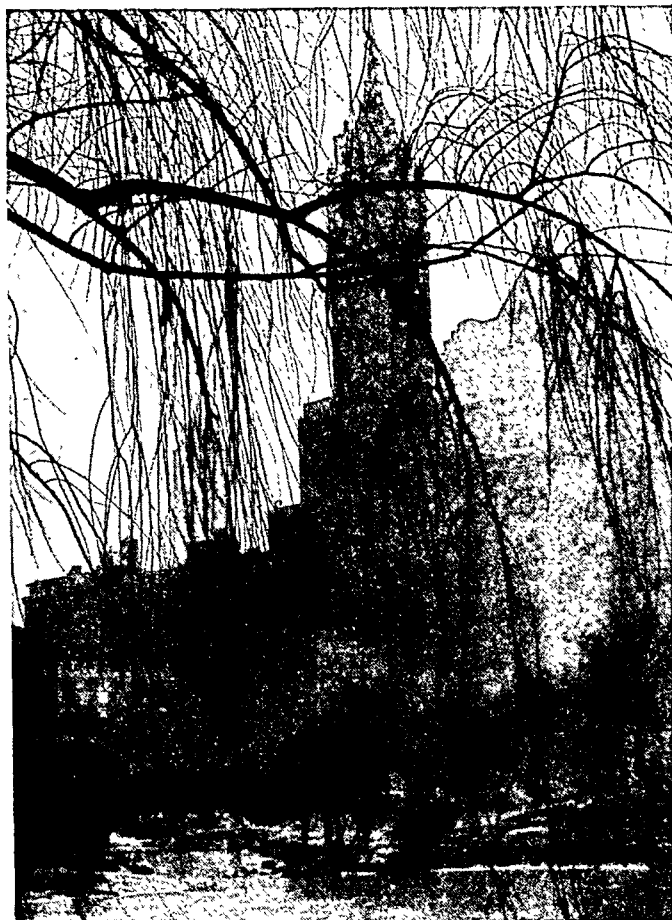
Stripping film and process film of high contrast type have almost entirely replaced the wet plate in photolithography, and to a lesser extent in photo-engraving. There was some interest in the use of ultra-violet photography to facilitate production of high-light screen negatives and exaggerate contrast. Police departments showed a greater interest in the use of photography in crime detection.

The illustrated newspapers and magazines gave evidence of the steadily increasing use of photography for news reporting. One of the outstanding news events of 1939, the visit of the King and Queen of England to Canada and the United States in May and June, was very extensively covered, and the war in Europe provided much in the way of propaganda and news pictures. These were subject to censorship by the nations concerned, but a fair

number were transmitted by radio to New York. The possibilities of press photography were extended by the newly introduced fast films, and by the use of telephoto lenses of very long equivalent focus.

There was much activity in aerial photography during 1939, and it was accelerated by the war in Europe, particularly for reconnaissance purposes. There has been some interest in the use of small cameras for aerial work. The necessity for flying high led to the use of normal aerial cameras fitted with telephoto lenses, and using infra-red and extreme red sensitive films for haze penetration. Colour photography and infra-red photography were studied for their possible use in camouflage detection, and flashlight photography for night work. The Fairchild Camera Corporation made a new camera taking the largest single negative yet used in aerial photography. The picture is 18in. square, and the lens of aperture $f/6.8$ and 12in. focal length. The roll of film accommodates 600 exposures. In England, a 7-lens aerial camera was produced under the direction of the Air Survey Committee. There was a trend towards the use of cameras provided with short focus, wide angle lenses, covering more terrain on a single negative, and so saving flying time and film. The large United States aerial survey for crop and erosion studies and mapping was continued. There was much use of gun cameras and motion pictures for military training purposes. (See also ADVERTISING; ASTRONOMY; AVIATION, CIVIL; ELECTRIC LIGHTING; LIBRARIES; MOTION PICTURES; PHOTOGRAPHY, MINIATURE CAMERA; PRINTING.)

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"WINTER MORNING, NEW YORK CITY" was hung in the principal photographic salons in 1939 and won several prizes; it was taken by H. J. Phillips, a member of the Camera club of New York

Photography, Miniature Camera. As the miniature camera offers many advantages and conveniences such as small size, light weight, ease in taking many exposures, fast lenses and fast shutter speeds, economy of materials, use of colour films, and other features, it is no wonder that nearly 5,000,000 new photographers have entered the field during the past ten years in England and the United States. These miniature camera owners have found a new release for their own ideas and the interpretation of all the modern activities associated with their daily living. Thrilling experiences are found in candid photography, action pictures of all kinds, children and family pictures and many others.

During the winter and spring of 1939 miniature camera photography undoubtedly had its greatest peak of popularity in the United States, England, Germany and a few other countries. The 35mm. cameras such as the Contax, Leica, Retina and others were in great demand through England and Germany. In the United States the trend toward the larger miniature camera sizes was quite noticeable. By spring and summer of 1939 the cameras making $2\frac{1}{4} \times 2\frac{1}{4}$ size negatives such as the Rolleiflex, Ikoflex, Super Ikonta B, and others were very popular. This trend continued with the introduction of the $2\frac{1}{4} \times 3\frac{1}{4}$ Speed Graphic camera in the United States. This latter camera which enjoyed enormous sales throughout 1939 attracted many photographers who had been formerly using the 35mm. cameras exclusively.

By the end of 1939 the sale of the miniature $2\frac{1}{4} \times 3\frac{1}{4}$ Speed Graphic camera in the United States was definitely on the increase along with many of the $2\frac{1}{4} \times 2\frac{1}{4}$ miniature cameras in spite of the European war which had a marked effect upon the importation of German cameras into England and the United States.

Although stocks of the German miniature cameras were not exhausted, the actual sale of the higher priced cameras fell off by the

end of 1939 to as much as 50% or more in some cases. The list prices for imported cameras remained unchanged for 1939 even after the war started.

The 35mm. cameras represented the greater number of miniature camera sales in England and Germany during the first nine months of 1939, while in the United States the balance was gradually changing from the smaller size miniature cameras to the twin lens reflex cameras such as the Rolleiflex and the Iko-flex, with the new $2\frac{1}{4} \times 3\frac{1}{4}$ miniature Speed Graphic camera heading the list of the larger size miniature camera demand in the United States.

Undoubtedly one of the factors creating this trend toward the use of larger miniature camera films has been the development of Speed Flash photography. With the modern Micromatic Synchronizers, such as the Kalart, which make it possible to operate camera shutters at their highest speeds and synchronize a flash-bulb at the same time, photographers found a new aid in obtaining photographs which could not be taken before.

The new Super Speed films were another factor in the popularity of the miniature camera. With film speed increases of two to as much as six times over former films, photographers could use smaller lens stops and obtain greater depth of field in their pictures. This greater depth of field was formerly an almost exclusive feature with the 35mm. cameras and their short focal length lenses.

A third factor to be taken into consideration is the continual development of the amateur photographers' ability to discriminate between good and bad picture quality. As an average it was found that the larger negative size produced a finer tone gradation and print quality.

While there is no one universal camera, there is a definite trend toward the possession of two cameras, a 35mm. and one of the larger miniature camera sizes up to as large as $2\frac{1}{4} \times 3\frac{1}{4}$ inches.

Another development during the early part of 1939 was the deluge of cheap 35mm. cameras which flooded the markets in the United States and, to some extent, in England. These cameras were introduced under extravagant advertising claims for precision workmanship, speed lenses, candid camera qualities, etc. However, with such cheap cameras selling in the United States for as low as 98¢ and \$1.95, it was impossible to make anything of a permanent lasting value. The result of this came with the rapid decline in sales of these cheap cameras by the end of 1939. However, sales of other low priced 35mm. cameras ranging in price from \$14 to \$35 held up very well and were on the increase.

General observation shows that the 35mm. miniature camera still has a very definite place in photography. With the enormous use of 35mm. Kodachrome colour film, the 35mm. cameras are continually in demand.

Probably another barometer in the steady interest for the 35mm. camera has been the enormous sale of the *Leica Manual*. By the end of 1939 over 50,000 copies of this book had been sold in England and the United States over a period of three years. (See also PHOTOGRAPHY.)

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Physics.

Nuclear Physics.—A new type of atomic disintegration was discovered in 1939 by Hahn and Strassmann in Germany. It was found that uranium, the heaviest known element, when exposed to neutrons breaks up into several different elements with atomic weights about half that of uranium. It is supposed that a uranium atom, of atomic weight 238, absorbs a neutron, so becoming a uranium atom of atomic weight 239, and that this new atom is unstable and breaks up into two roughly equal parts. Barium, antimony, tellurium, iodine, caesium and other elements are found among the products formed. Such a dis-

integration of a heavy atom into roughly equal parts is called fission. Thorium and protactinium also have been found to undergo fission when exposed to neutron bombardment.

The atomic number of uranium is 92 so that a uranium atom of atomic weight 239 contains 92 protons and 147 neutrons. If the nucleus of this atom breaks up into two parts the sum of the atomic numbers should be 92 and the sum of the atomic weights 239. However there are not among the known stable elements any two whose nuclei satisfy these conditions. For example, barium has atomic number 56, krypton 36 and $56+36=92$ but the highest atomic weight of barium is 138 and that of krypton 86 and $138+86$ is only 224 instead of 239. It is necessary therefore to suppose that the products of the fission are not stable atoms but unstable or radioactive atoms. In fact Hahn and Strassmann were able to detect the products formed by means of the beta rays which they emit. Thus the barium atoms formed have atomic weights greater than 138 and are unstable emitting beta rays.

When a beta ray is emitted a neutron changes into a proton so that when a barium atom emits a beta ray its atomic number is increased by one and it becomes a lanthanum atom. Neutrons in the unstable atoms formed by the fission change into protons with the emission of beta rays until stable atoms are formed.

The fission of a heavy atom involves the release of a very large amount of energy. The atomic weight of uranium with $0^{16}=16$, as determined with the mass spectrograph, is 238.09 and the elements with atomic weights between 80 and 120 have atomic weights equal to an integer plus 0.94. It follows that if a uranium atom changes into two stable atoms with atomic weights between 80 and 120 there is a loss of mass of $2.09-1.88=0.21$ atomic weight units. One atomic weight unit is equal to 931,000,000 electron volts so that the energy released by the fission of a uranium atom should be about 931×0.21 or almost 200,000,000 electron volts. The fission of the uranium atom therefore is an atomic explosion and the fragments fly apart with enormous kinetic energy.

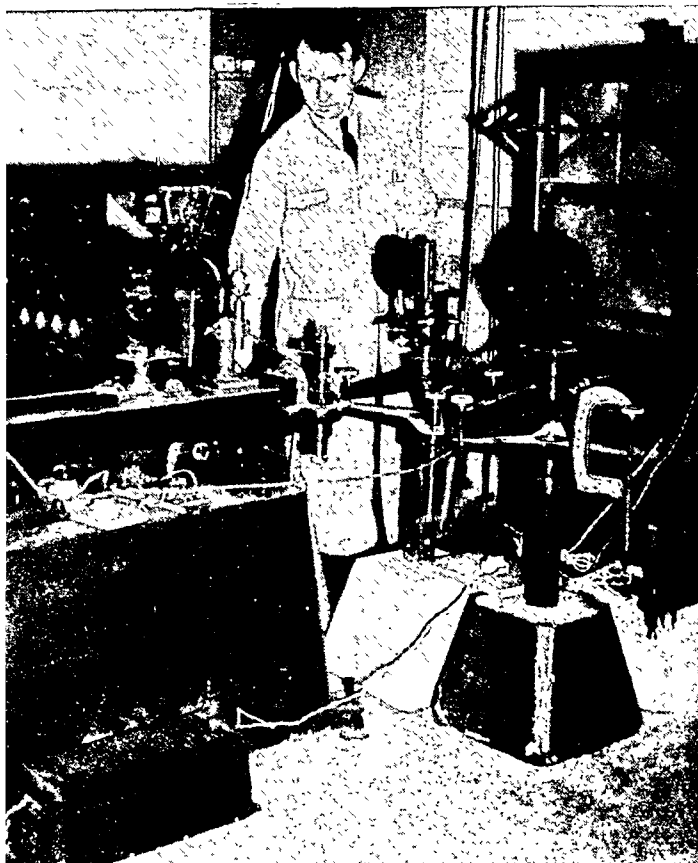
Carson and Thornton at the University of California placed a thin layer of uranium in a closed expansion chamber near to a source of neutrons and obtained photographs of the tracks made by the fragments. The kinetic energy of the fragments calculated from the length of the tracks agreed roughly with that estimated from the loss of mass.

It is found that neutrons are emitted during fission so that since fission is produced by neutrons it seems possible that the fission process once started in a mass of uranium might be able to maintain itself without any supply of neutrons from outside. The neutrons readily escape from the uranium so that the concentration of the neutrons will be greater the greater the volume of the uranium.

It seems possible that in a very large mass of uranium the concentration of the neutrons due to fission, once started in the mass, might go on increasing and so the rate of fission go on increasing until the uranium was volatilized by the energy set free. However the results obtained so far seem to indicate that such results are not possible and the existence of large masses of uranium ore on the earth for millions of years confirms this.

Hahn and Strassmann's discovery of fission is important because fission is quite different from previously known atomic disintegrations. All such involved the combination of a nucleus with a particle, like a proton or deuteron, of small atomic weight, followed by the emission of another particle also of small atomic weight. For example, a magnesium atom, of atomic weight 26 absorbs a deuteron of atomic weight two and then emits a helium atom of atomic weight four so that the magnesium atom is changed into a sodium atom of atomic weight 24.

The nucleus of a heavy atom may be regarded as analogous to



CORRECT TO WITHIN $2\frac{1}{2}$ MILES PER SECOND, the first completely automatic device for measuring the speed of light was perfected in 1939 by Wilmer C. Anderson of Harvard university

a minute spherical drop of water very highly charged with positive electricity. If such a drop is violently disturbed so as to become elongated the repulsion between the positive charges on its ends may be sufficient to cause it to break up into two nearly equal drops. It is supposed that fission is analogous to such a breaking up of a charged water drop.

Cosmic Rays.—On June 27-30, 1939 a congress of about 300 scientists interested in cosmic rays was held at the University of Chicago. The proceedings of this congress have been published in the *Reviews of Modern Physics* and contain many notable contributions to the subject.

The existence of heavy electrons or mesotrons, as they are now called, as an important constituent of cosmic rays has been abundantly confirmed. The primary cosmic rays which enter the earth's atmosphere from outside produce secondary rays as they pass through the air or other materials. Cosmic rays are a mixture of electrons, positrons, mesotrons, protons, neutrons, photons, and perhaps other particles but it is difficult to decide which of these are the primary rays.

Recent studies show that the neutrons increase rapidly with elevation, more rapidly than the total cosmic ray intensity but at about the same rate as photons. It is suggested that the neutrons may be due to the disintegration of atomic nuclei by high energy photons or electrons.

There is evidence that a photon or electron with energy greater than one hundred million electron volts can cause a nucleus to break up into its constituent protons and neutrons.

The very penetrating cosmic rays observed hundreds of feet below the surface of the ground are believed to be protons and mesotrons.

Cosmic ray particles with energies up to one thousand million electron volts have been observed. Such energies cannot be derived from the annihilation of any atom or indeed by any imaginable single process. It seems therefore that there must exist in nature some process by which the energy of a particle can

be increased almost without limit either continuously or by a series of increments.

Mesotrons are found to have a life of only a few millionths of a second. They are unstable and probably break up into an electron and a neutrino or a photon or both. It is clear therefore that mesotrons are not primary cosmic rays.

Magnetic Moments of the Proton and Deuteron.—An exact determination of the magnetic moments of the proton and the deuteron has been done at Columbia university by Rabi and his associates. Hydrogen gas was allowed to enter a large highly evacuated chamber through narrow slits. The molecules from the slits were focused on to a sensitive Pirani gauge detector by means of two magnets. Between the two magnets the molecules passed between the poles of a third magnet. A weak alternating magnetic field at right angles to the field of the third magnet was produced by means of the current from a high frequency oscillator.

The hydrogen molecules which act like small magnets are lined up by the field of the magnets and focused on the detector but if the alternating field disturbs this orientation the focusing is prevented which is indicated by the detector. The hydrogen molecules act like magnetic spinning tops and precess around the direction of the magnetic field. When the frequency of the alternating field is equal to that of the precession a sort of resonance effect between the alternating field and the molecules occurs and the molecules are disturbed even by a very weak alternating field. The magnetic moment of the molecules can be calculated from the frequency of the alternating field which prevents the focusing and the strength of the steady field of the third magnet. In this way it was found that the magnetic moment of the proton is 2.80 and that of a deuteron 0.86 nuclear magnetons.

Viscosity of Air.—A remarkably exact determination of the viscosity of air has been done by Bearden at Johns Hopkins university. It is important to know this quantity accurately because the determination of the electronic charge by the falling drop method depends on its value. Bearden's apparatus consisted of two concentric metal cylinders. The outer cylinder was suspended by a wire and the inner one kept rotating with uniform angular velocity. The torque on the outer cylinder due to the viscosity of the air in the space between the two cylinders was measured. The value of the electronic charge deduced from Millikan's oil drop experiments using the new value of the viscosity of air is 4.81×10^{-10} electrostatic units. This is about 1% greater than Millikan's old value 4.77×10^{-10} .

Cyclotrons.—The 200 ton cyclotron at the University of California has been placed in operation. It is being used to produce neutrons for medical purposes as well as for investigations in nuclear physics. It was reported in newspapers that the University of Texas had offered to put up about \$1,000,000 for the construction of a 2,000-ton cyclotron to give particles with over 100,000,000 electron volts energy. Such a machine would probably require 5 to 10 years to build and get operating and around \$100,000 a year for operating expenses. Several smaller cyclotrons in the United States and Europe were placed in operation during 1939.

Separation of Isotopes.—A new method of separating gaseous isotopes was developed in 1939. It depends on thermal diffusion. If a mixture of two gases with different molecular weights is placed between two plates, one hot and one cold, the concentration of the heavier gas gets greater at the cold plate than at the hot plate and that of the lighter gas greater at the hot plate than at the cold plate. To use this fact to separate isotopes the mixture of gases is put in the space between two concentric vertical metal tubes. The outer tube is kept cool by a water jacket and the inner tube is heated to about 400°C by an electric heater inside it. The hot gas near the inner tube then rises and

the cold gas near the outer tube sinks so that a circulation of the mixture goes on. The heavier gas therefore tends to collect at the bottom and the lighter gas at the top. By using several such tubes in series, each about 12ft. long, the concentration of the heavier gas in the mixture can be greatly increased and by several applications of the process the heavier gas may be obtained practically pure. For example, ordinary carbon of atomic weight 12 contains a small percentage of carbon atoms of atomic weight 13. Thus the gas methane CH_4 is a mixture of molecules of molecular weight 16 with a small percentage of molecules of molecular weight 17. By means of this new process pure methane of molecular weight 17 may be obtained. This new process will enable many mixtures of gaseous isotopes to be separated in appreciable quantities so that the pure isotopes will be available for chemists to study their chemical properties and for physicists to study their nuclear reactions. (See ISOTOPES, SEPARATION OF.)

(H. A. W.)

Physiology. Perhaps the most active fields in physiology have been the endocrine glands, the vitamins and the central nervous system. A development of great practical, as well as theoretical, importance has resulted from the study of vitamin K, the anti-haemorrhagic vitamin. Although its complete chemical structure is not yet elucidated, related synthetic substances which exhibit a high degree of biological activity have been prepared. In the absence of bile in the intestine the vitamin is not adequately absorbed; as a result, certain of the clotting elements of the blood are reduced to the point where haemorrhage occurs. These studies have provided an explanation and a therapy for certain types of human haemorrhagic diseases and new information regarding the process of blood coagulation. Vitamin E, the anti-sterility vitamin, has been synthesized, and the results of experiments conducted on a variety of animal species indicate that this element is essential for the maintenance of nervous and muscular tissues as well as reproductive tissues. Whether Vitamin E is required by man is not certain. Extensive investigations in man have demonstrated that nicotinic acid is the long-sought pellagra-preventive vitamin. It possesses dramatic curative properties when administered to the pellagrin. Careful studies of Vitamin G, or riboflavin, deficiency have served to reveal the characteristic symptoms in man as well as in other species. Vitamin B_6 , whose deficiency in rats causes severe dermatitis of the extremities, has been synthesized and recent information suggests that this nutritional factor is concerned with the metabolism of the essential fatty acids. Evidence has been advanced that Vitamin B_6 is required by the human organism. Pantothenic acid,

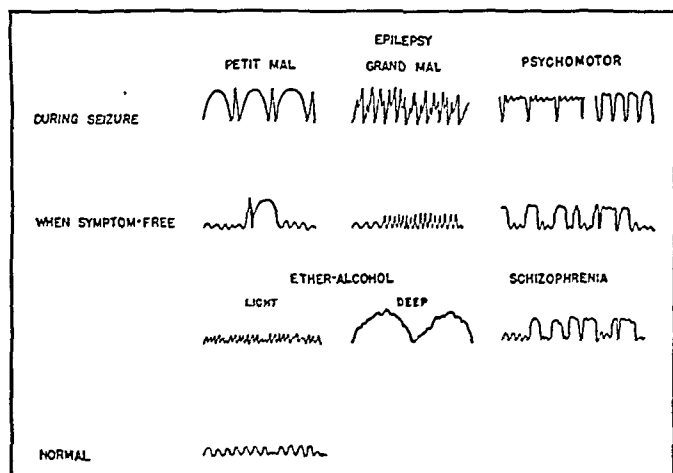
originally designated as a component of Bios, a complex required for the growth of yeast, appears to be identical with a vitamin whose deficiency in chicks produces a severe dermatitis. The year 1939 has seen several proposed new additions to the growing family of vitamins, but it is too early to appraise dependably these claims. An important development in the field of vitamins has been the realization that many of them function as components of various enzyme systems of the body. This relationship between the two fields has stimulated activity and materially aided progress in the study of vitamins and tissue respiration. An enormous amount of investigation in the latter field has contributed innumerable new details and principles which will serve as a basis for future understanding of the mechanism by means of which the living organism releases energy and carries on its diverse and complex activities.

Endocrinology.—In the field of endocrinology equally important advances have been made. Prolan, a hormone obtained from the urine of pregnant women and which stimulates the gonads, appears to have been conclusively demonstrated to originate in placental tissue. Synthetic female sex hormones have been prepared which are much simpler in their chemical structure than the naturally occurring products, but which, nevertheless, exert identical influences on the sexual apparatus. As a result of the development of new methods for determining the urinary excretion of the hormones of the corpus luteum, it has been possible to study in more detail the activities of the latter endocrine structure in normal, diseased and pregnant women. It has been repeatedly demonstrated that both male and female sex hormones are produced in either sex, and that to a certain extent the male and female hormones are bisexual in the effects which they produce. A relationship has been shown to exist between sex hormones and the hormones of the adrenal cortex, a finding which has contributed the solution of important questions in physiology and in medicine.

Our knowledge of hermaphroditism has been substantially advanced by detailed studies of intersexuality produced experimentally in a variety of mammalian forms by the administration of sex hormones. The endocrine activity of the placenta has been shown to play an important rôle in the maintenance and termination of pregnancy. Recent methods which permit microscopic observation of bits of living thyroid tissue in animals promise to yield valuable information regarding the activities of this endocrine gland. Study of the pituitary hormones, their effects, and the regulation of their production continues and new pituitary hormones are still being proposed.

Nervous System.—The physiology of the central nervous system has been investigated with increasing intensity. In particular, important studies on the hypothalamus have contributed to our knowledge of its role in the regulation of autonomic function, emotional states, sleep, thermal regulation and control of the endocrine activities of the hypophysis. Fruitful researches have been conducted on the complex functions of the motor, sensory, and associative areas of the cerebral cortex and their relationship to the cerebellum and mid-brain. Improvements and refinements in the technique of recording and interpreting the so-called brain waves, obtained with the aid of the electroencephalograph have been introduced and widely adopted. (See also VITAMINS.)

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SAMPLE PATTERNS OF BRAIN WAVES in various conditions: from Gibbs, Gibbs, and Lennox in *The American Journal of Psychiatry*

Pickwick Landing Dam: see TENNESSEE VALLEY AUTHORITY.

Pig Iron: see IRON AND STEEL.

Pigs: see HOGS; LIVESTOCK.

Pineapples. Production of pineapples in the United States in 1939 (all in Florida) was estimated by the Department of Agriculture as 15,000 boxes, compared to 20,000 boxes in 1938 and a 10-year (1928-37) average of 13,750 boxes. Exports of canned pineapples and juice from Hawaii the first 11 months of 1939 were reported by the U.S. Department of Commerce as approximately 19,600,000 cases, or about 3,000,000 cases more than in the same period in 1938. Owing to increased world demand for canned pineapple for the short season in British Malaya, ending March 31, 1939, the Central Board authorized an increase in production from 850,000 to 1,030,726 cases. The British Malaya production quota for the main season, April 1 to Sept. 30, 1939, was 1,000,185 cases. Under this control only nine of the 16 canneries operated, six remaining idle and receiving their supplies from the operative canneries in order that those in operation might run at more economical capacity. Exports of pineapples from Havana to the United States for the season ending June 30 were, "pineapples in crates, number, 1,212,347" in 1939 and 947,048 in 1938, while bulk exports were 1,601,488 lb. in 1939 and 4,921,134 lb. in 1938. Decrease in Cuban bulk exports was because of activity in Cuba to process the fruit there and then export it, rather than to ship it to United States canneries for processing.

(S. O. R.)

Ping-Pong: see TABLE TENNIS.

Piped Light: see PLASTICS INDUSTRY.

Pittsburgh, a city in southwestern Pennsylvania, had an estimated population of 702,000 in 1939 and an area of 54.295 square miles. In the November elections the city and county remained in the ranks of the Democratic party.

At the 37th annual International Art Exhibit, held in the galleries of Carnegie Institute, though five nations were represented, five of the seven major winners of awards were American. First prize was awarded to Alexander Brook, an American from New York city for his painting "Georgia Jungle"; and the second award went to the American-born Yasuo Kuniyoshi of Woodstock, N.Y., who exhibited "Lay Figure—1938." The Pittsburgh Symphony, enjoying a second successful season under Conductor Fritz Reiner, was enabled to extend its activities to include a series of special concerts for high school students and held in their school auditoriums by a special grant of \$50,000 from the Buhl Foundation.

The Pittsburgh Housing Authority, with an \$18,000,000 fund, 90% of which comes from the Federal Government, began construction of three large-scale housing projects, all located in the upper Hill District. The planning and construction of Terrace Village No. 1 and Terrace Village No. 2 is one of the most spectacular in the United States, for more than 2,000,000 cu.yd. of earth must be removed from three rugged hills. The project includes a 14ac. public playground, and when completed will house at low rents approximately 3,000 families.

In co-operation with the Pittsburgh Housing Association, a private Community Fund Agency, the Bureau of Sanitation has demolished hundreds of unsafe and unsanitary dwellings, and the Department of Health has corrected unsanitary conditions in several thousand houses. The Community Fund drive, November 13-30, 1939, raised \$2,552,000.

Formal dedication of the Buhl Planetarium and Institute of Popular Science, a gift to the city in memory of Henry Buhl, Jr., by the Buhl Foundation, took place late in October. In addition to the Planetarium the building houses a lecture hall which is equipped to present educational and scientific motion pictures, and

five galleries to be devoted to free scientific exhibits telling, popularly the story of physics, chemistry, astronomy and other sciences. This, the fifth planetarium in the U.S., cost approximately \$1,100,000.

The significant industrial news of 1939 was the phenomenal business recovery in the latter half of the year. During the first six months bituminous coal production was low because of labour disturbances. Despite this, recovery was such as to have a production, during the year's first 11 months, 17% (for the State) greater than that of the same period the preceding year. New highs in production were reached in pig iron, 839,000 tons in November—12,000 tons greater than the previous high in Aug. 1929; in electric power sales to industrial users; in retail sales, which were approximately 5% greater than in 1938. During the month of December there was a general levelling off of business, but the general business index (based on the 1923-25 average) was estimated at 93.3% for the year. (J. G. Bo.)

Pius XI (1857-1939) was elected pope in 1922. He was born at Desio, near Milan, on May 31, the son of Francesco Ratti, silk manufacturer. At baptism, he was named Ambrose Damien Achille. Educated at the seminary in Milan, later at the Lombard college and the Gregorian university, Rome, he was ordained priest on Dec. 20, 1879.

After further study and a brief curacy, Father Achille Ratti was named professor of sacred theology at the Grand seminary, Milan, in 1882. Six years later, he joined the staff of the Ambrosian Library, Milan, as a member of the college of doctors. In 1907, he became prefect of the Ambrosian, and effected a complete modernization program. During these years he published several learned studies, dealing especially with Latin palaeography. He exercised the priestly ministry as chaplain of the Cenacle nuns. His vacations were spent mountain-climbing in the Alps, about which he wrote memoirs. In 1912 he was called to Rome as vice-prefect of the Vatican library, and later became prefect.

His future was changed in 1919 when he was impressed into the Vatican diplomatic service and sent as nuncio apostolic to Poland. At the same time, he was consecrated titular archbishop of Lepanto. His position as nuncio during the years following the war was difficult but was accomplished with the approval of all parties.

In June 1921 he was named archbishop of Milan and cardinal. Upon the death of Benedict XV, the following year, Cardinal Ratti was elected pope on February 6 and crowned as Pius XI on February 11.

Tremendous activity marked his pontificate. Notable among his achievements was the settlement of the Roman question by the Lateran treaty and the Concordat with Italy, Feb. 11, 1929. He laboured incessantly for the creation of peaceful relations between nations, and for peace between the church and Governments. Likewise, he was a vigorous, dynamic leader in the regeneration of human society and in the spiritual advance of the church. His numerous encyclicals are classic treatments of international, economic, social, and spiritual topics. Courage and gentleness, awareness of the world, and closeness to the teachings of Christ characterized his pontificate. Mourned universally, he died on February 10, in his 82nd year. (See also RELIGION; ROMAN CATHOLIC CHURCH.) (F. X. T.)

Pius XII (1876-) was elected by the College of Cardinals as the 262nd Pope on March 2, his 63rd birthday, and was crowned on March 12. He was born in Rome, the son of Filippo Pacelli, dean of the Vatican Advocates, and baptized with the name of Eugenio. Following his ordination to the priesthood on April 2, 1899, he continued special courses in civil and canon law.

Eugenio Pacelli entered the Papal Secretariat of State in 1901. When the codification of canon law was begun under Cardinal Gasparri, he was engaged as assistant. Meanwhile, he carried on his priestly ministrations and preached frequently. In 1914, he was named secretary to the Congregation for Extraordinary Ecclesiastical Affairs. *

The then Pope, Benedict XV, on April 20, 1917, chose Monsignor Pacelli for the delicate office of Apostolic Nuncio to Bavaria, the only diplomatic contact between war-torn Germany and the Holy See. On May 13, he was consecrated titular bishop of Sardes. Upon the establishment of the German Republic, he was instrumental in negotiating a nunciature, and was named first nuncio to Germany, establishing his residence in Berlin in 1925.

In recognition of his services in Germany, he was called to Rome and, on Dec. 16, 1929, was created Cardinal. This was preparatory to his appointment by Pius XI, on Feb. 7, 1930, as Papal Secretary of State. During the next nine years, his public life merged with the achievements of the dynamic pontificate of Pius XI.

As Papal Chamberlain, Cardinal Pacelli announced the death of Pius XI on Feb. 10, 1939. Sixty-two Cardinals assembled for the election of a new Pope on March 1. On the third ballot of the first day of voting, March 2, Cardinal Pacelli was chosen Pope, and assumed the name of Pius XII. He was crowned with the triple tiara on March 12, in the presence of some 125,000 spectators assembled in the square before St. Peter's.

During the first year of his pontificate, Pius XII devoted himself to the cause of world peace. His first address, broadcast to the world on the morning after his election, was an appeal for peace within and among nations. Again, at Easter, he renewed his demand for peace and his condemnation of war acts. On April 20, he ordered a "crusade of prayer" for the preservation of peace.

During May and June, he sought by diplomatic approaches to Great Britain, France, Italy, Germany and Poland, to prepare for a peace conference.

Though his advances were received favourably, his proposals were not accepted by the Governments. He continued, nevertheless, to strive through the summer to ease the tension, especially between Poland and Germany. On August 31, as a final act, he urged a five-power conference to avert hostilities and to seek revision of the Versailles Treaty.

During September and October, he seized every opportunity to plead for the avoidance of war horrors, especially against civilian populations. Courageously, he showed sympathy with Poland, after the German aggression and the Russian invasion, and condemned both Governments. On November 10, he intimated the need for "a stable organization of nations."

Pope Pius welcomed the proposals looking toward parallel peace efforts of religion and government issued by President Roosevelt on December 23. Speaking before the Cardinals on Christmas Eve, he laid down five points necessary for "a just and honourable peace," namely, the right to life and independence of all nations, acceptance of the principle of disarmament, a system of international arbitration, recognition of the just demands of nations, peoples and minorities, and acceptance by peace negotiators of the principles of justice and charity.

On October 27, he issued his first encyclical, *Summi Pontificatus*, dealing with the unity of human society. His *Sertum Laetitiae*, dated November 11, directed to the hierarchy of the United States, treated of American problems. Despite the stress of his peace efforts, he continued through the year holding audiences and making addresses, six of which were broadcast internationally. On December 28, the Pope visited the King and Queen of Italy, breaking a precedent of 70 years.

(F. X. T.)

Plastics Industry. As was predicted in 1938, the field of plastics was expanded still further in 1939. The infinite variety of objects that can be made from plastics is beginning to capture the imagination of the public and popular magazines as well as scientific journals published articles on plastics and the beautiful and useful products that can be made from them.

The re-armament program in Europe altered the program of plastic production in the European countries, reducing the production of phenol-formaldehyde moulding powder and increasing the manufacture of laminated phenolics. As always, most Government reports deal more with exports and imports than with production and estimation is reduced to "guess work." Reports on synthetic resin throw together resins used for plastics and for other uses such as paints and adhesives, and it is believed therefore that 1938's estimate on synthetic resins was high.

With the above explanation, we estimate the 1938 world production of cellulose derivative plastics to be 84,000 short tons, and that of synthetic resins to be 121,000 short tons.

More intelligent and artistic designing of plastic articles was apparent and plastics are now standing upon their own merits, the time being past when they were merely substitutes for accepted materials, and were accordingly made to simulate such materials. They are now filling many structural and utilitarian purposes.

The further development of injection moulding powders and multiple unit injection presses was accompanied by the wider use of plastics in automobile construction, such as steering wheels, radiator grilles, instrument panels, directional signs, and window reveals. Greater use of automatic compression type presses also helped in this development.

Phenol-formaldehyde thermosetting resins continue to lead other plastics in volume, partly because of an extended use of laminated sheets in architecture and decorations. Very large sculptural castings were made for the New York World's Fair. Industrial uses were music box assemblies lighted from within, impellers and rotors of pumps, chemical and sanitary piping and electric shaver cases. The use in radio cabinets was greatly extended, particularly in the case of the furfuralphenol resins because of their resistance to scorching during moulding.

Development of urea-formaldehyde resins was largely in improvements in structural design and better control of colour, these resulting in a rapid growth of the use of urea plastics for illuminated signs. There was also an increased use in laminations. Large sections such as refrigerator doors and store fronts were introduced.

Nylon, the new synthetic fibre introduced in 1938, found success as a bristle material for tooth brushes and hair brushes. In 1939, fishing leaders and surgical sutures from this strong synthetic material were introduced.

New uses of cellulose acetate moulding powder included moulded duck pins and shoe heels. Cellulose acetate rigid sheeting found use in making transparent containers for hats, garment accessories and other luxury articles. Acetate film, because of its light weight and its property of ultra-violet transmission, is being used for hot bed frames and solarium enclosures. In some places cellulose acetate butyrate was introduced in place of cellulose acetate because of its greater moisture-resistance and it was therefore used for flat sections such as instrument panels and glove compartment doors.

The acrylic resins, particularly methyl methacrylate, have gone ahead by leaps and bounds. Divers uses of both cast resins and moulding powders have been found. The use of methyl methacrylate dentures has become wide-spread in England and the United States, new methods of application having been developed which make the material more easily worked by dental technicians.

Highway lighting reflectors have increased in use and spectacle lenses are now being made to prescription by moulding. The edge-lighting property of methyl methacrylate resin has led to increased use in signs and displays and the use of "piped light" in the surgical field is on the increase. Polyvinylacetyl resin as the interlayer in safety glass is now used in practically all automobiles manufactured in the United States, and in some of Canadian manufacture. Thus far there is no other important use of resins of this type.

Other vinyl resins, including polyvinyl chloride, polyvinyl acetate and after-chlorinated polyvinyl chlorides, found use for adhesives, impregnation of fabric for wrapping pipe lines, impregnation of silk for raincoats, injection moulded articles, extruded cable coatings, slide rules and triangles, book bindings and storage batteries. Polystyrene, heretofore available chiefly in Germany, was produced in the United States and found service as acid bottle adapters, cosmetic packages, refrigerator knobs and dials, transparent dishes and condenser insulation. Its use in Germany was greatly extended over that of 1938, an estimated sale of 2,000 tons being reported.

Information as to specific European developments is meagre and unreliable because of the war. After the war clouds have cleared, reports of startling developments will probably be obtained. (See also CHEMISTRY, APPLIED; INDUSTRIAL RESEARCH; PAINTS AND VARNISHES; RAYON; RUBBER AND RUBBER MANUFACTURE; TEXTILE INDUSTRY; WOOL.) (H. W. PA.)

Plastic Surgery: see SURGERY.

Platinum. No data have been published on the Russian platinum output since 1926, and data on exports are incomplete; since these figures vary widely from year to year, the world totals fluctuate accordingly, and do not represent a true picture of the industry, as it is not known how much of the Russian shipments is from current production and how much from accumulated surplus stocks from previous years. The world supply in 1938 is estimated to have been in excess of 400,000 ounces.

From 12,500 oz. in 1929, the Canadian production increased to 161,300 oz. in 1938, with prospects for a further increase in 1939. The next largest producer is Colombia, with an output which has dropped in the past few years from 55,000 oz. to less than 30,000 ounces. The fourth large producer is South Africa, which had a high figure of 45,500 oz. in 1930, but averaged about 26,000 oz. from 1934 until it rose to 31,200 oz. in 1937, and to 42,300 oz. in 1938; production continued to increase in 1939, and for the first eight months of the year was at the record rate of 58,000 ounces. The United States output stands fifth in the list, the yield since 1935 having been boosted above the previous level by a new placer deposit in Alaska. In 1938 the recovery of by-product platinum was 3,800 oz., and of placer crude 42,000 oz., the exact platinum content of which is unknown. (G. A. Ro.)

Pliofilm: see INDUSTRIAL RESEARCH; RUBBER AND RUBBER MANUFACTURE.

Plums and Prunes. Large crops and marketing difficulties, because of the European war, caused the Yugoslavian Government to take over prune exports in 1939 and to guarantee a minimum price to plum and prune growers. In Bulgaria 6,000,000kg. of prune pulp, a newly-developed product for export, were shipped to Germany. The Bulgarian crop was estimated at about 130,000,000kg. compared to 96,000,000kg. in 1938. In New Zealand, which exports about 2,500,000lb. of prunes annually, experiment was begun with a plantation of 500 trees of new variety. In the United States a

part of the 1939 crop of prunes was left on the trees because of low prices. The plum crop in the United States in 1939 was reported by the Department of Agriculture as 75,300 tons, compared to 65,900 tons in 1938 and a ten-year (1928-37) average of 67,590 tons. By States the plum crop was, in tons:

	1939	1938	10-yr. average
California	69,000	63,000	61,800
Michigan	6,300	2,900	5,790

The prune crop in the United States in 1939, in 1938 and for the ten-year (1928-37) average was, by States, in tons, as follows:

PRUNES DRIED			
	1939	1938	10-yr. average
United States	212,400	238,300	225,300
California	184,000	224,000	198,600
Oregon	26,600	13,300	23,460
Washington	1,800	1,000	3,440
PRUNES USED FRESH			
	1939	1938	10-yr. average
United States	54,900	48,500	49,350
Idaho	20,200	15,200	18,110
Oregon	19,400	17,800	17,000
Washington	15,300	15,500	14,240
PRUNES CANNED			
	1939	1938	10-yr. average
United States	31,500	15,500	18,460
Oregon	25,600	12,400	13,940

(S. O. R.)

Pneumonia. The year 1939 stands out as a banner year in the history of the control of pneumonia. Interest has been focused chiefly on the therapeutic use of the new derivative from sulphanilamide, sulphapyridine. The chemical formula of this agent is 2-(p-aminobenzene-sulphonamide) pyridine; it was originally produced in England in 1938 under the trade name of M&B 693. One of the most interesting features of sulphapyridine is its applicability to all types of pneumococci, and it appears to be just as efficient against the streptococcus haemolyticus as sulphanilamide itself. Some authors claim that certain strains of pneumococcus may develop a tolerance to the drug, but from the standpoint of practical experience, this must be an extremely rare occurrence. There is still some debate as to which of the two agents, sulphanilamide or sulphapyridine, is the less toxic. No doubt further studies will supply a definite answer to this question, but for the present it is safe to say that there is not a great deal of difference in their toxicity for man.

Sulphapyridine is less readily and more irregularly absorbed in man than is sulphanilamide, and furthermore, a considerable inactive fraction accumulates in the blood in the form of conjugated or acetylated sulphapyridine. Due to this fact, it is impossible to foretell from the amount of the drug administered the resulting blood level of the active unbound drug. It may vary widely, due to the difference in the amount of drug conjugation in different subjects. Often extremely high blood levels will be obtained with apparently small doses of the drug, and conversely a clinical response may be obtained with blood levels of only 1 to 2 mgms. per cent. The ideal blood level has not yet been established, but it is probably somewhere between 5 and 10 mgms. per 100c.c. of blood.

The effect of sulphapyridine on the clinical course of pneumonia is usually prompt and dramatic. Within a few hours after the initial dose, the temperature may drop to normal by crisis and the patient seems much more comfortable, though there may be some nausea and depression resulting from the drug. With the drop in temperature, there is a corresponding fall in pulse and respiration.

The toxic effects of sulphapyridine are varied. Most common of these is nausea and vomiting. Other less frequent complications are a rapid fall in the total number of red or white corpuscles in the blood, mental depression, fever, and drug rashes. Occasionally the drug precipitates in the urinary tract to form stony concretions.

The statistical reports on the effect of sulphapyridine on the fatality rate of pneumonia show an amazing drop from a standard death rate of 25% to 30% in patients who have not received specific treatment to a figure between 5% and 10% for patients treated with sulphapyridine.

The writer compiled from the American literature 956 cases of pneumococcal pneumonia treated with sulphapyridine. The death rate for this entire series was only 7.1%.

Favourable reports continue to appear on the value of concentrated rabbit serum in the treatment of pneumonia. For example, C. M. McLeod reports 100 pneumonia patients treated with specific rabbit serum, of whom only eleven died.

Of these eleven, however, seven deaths were due to Type III pneumococcus, a type for which the most ardent advocates of serum therapy have never made many claims. It seems quite clear that with the refined rabbit serum now in use, the results obtained are quite as good as those which result from chemotherapy, Type III cases of course being excluded.

A practising physician now has a double-barrelled weapon for fighting pneumonia. For many reasons chemotherapy is preferable to serum therapy because of its simplicity of administration by mouth and because it is effective in all types of pneumonia. However, there are still 5% to 10% of patients who die in spite of sulphapyridine, and many authorities believe that when sulphapyridine fails to give prompt results, the treatment should be supplemented by specific serum therapy. They believe that for both theoretical and practical reasons, all pneumonia patients with bacteria in the blood-stream should receive both agents. The writer is quite sympathetic with such a point of view. It seems quite possible, however, that as we become more skilful in the use of chemotherapy, there will be less and less need for serum therapy.

Finally, there are certain patients who, because of drug idiosyncrasy cannot take sulphapyridine. Specific serum should be used in such cases.

In addition to these important advances in the field of specific therapy, some progress is also being made in oxygen therapy. Efforts are now being made to simplify oxygen therapy and to get away from the complicated and expensive oxygen chambers and oxygen tents. As a substitute for elaborate methods, several types of nasal inhalators have been introduced and the face masks of Barach and of Boothby have also attracted attention. These simplified methods, however, all have certain disadvantages; it seems quite likely that the oxygen tent will continue to be the favourite method of administering oxygen for some time to come. Fortunately, with our greatly improved specific therapy, there will be less and less demand for oxygen therapy. (See also CHEMOTHERAPY; EPIDEMICS AND PUBLIC HEALTH CONTROL; MEDICINE; SERUM THERAPY.)

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Poetry: see AMERICAN LITERATURE; CANADIAN LITERATURE; DUTCH LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; ITALIAN LITERATURE; LITERARY PRIZES; PUBLISHING; SPANISH-AMERICAN LITERATURE.

Poison Gas: see CHEMICAL WARFARE; MUNITIONS OF WAR: Gas; LEATHER.

Poland. Area (Sept. 1, 1939) c. 150,820 sq.mi.; population (est. Jan. 1, 1939) 34,900,000; (Sept. 1, 1939) c. 34,200,000. Chief towns (pop. est. Sept. 1, 1939): Warsaw (1,300,000), Lodz (690,000), Lwow (350,000), Poznan (290,000), Cracow (280,000), Vilna (225,000). President (Jan. 1, 1939): Prof. Ignacy Mościcki; (Sept. 30, 1939): Wladislaw Raczkievicz; Premier (Jan. 1, 1939): Gen. Slawoj Skladkowski; (Sept. 30, 1939): Gen. Wladislaw Sikorski.

History.—The year 1939 marks the end of Polish independence, created by the Versailles Treaty in 1919. Nazi-Germany attacked Poland on Sept. 1, 1939 and, by that act, started the European war (*q.v.*). Great sections of the country, and especially the great cities like Warsaw, Lodz and Lwow, were severely damaged by constant bombardment during Sept. 1939.

International Relations.—Since 1934, and the conclusion of a non-aggression treaty with Germany, Poland's foreign policy tried to maintain a balance between the country's two powerful neighbours, Germany and Soviet Russia. On Jan. 25, 1939, Joachim von Ribbentrop, Nazi Foreign Minister, visited Poland for the celebration of the fifth anniversary of the Polish-German non-aggression treaty. The document was praised by him as one of the fundamental instruments of European peace, and as the basis for friendly Polish-German relations. In fact, the Polish foreign policy, under Colonel Beck, was considered, by a large section of public opinion in the democratic countries, as being pro-German.


When the Nazi Government, after the annexation of Czecho-Slovakia, made demands on Poland for the cession of Danzig, and for an ex-territorial road through Pomorze, the opposition in Poland, irrespective of party affiliations, was unanimous. Poland feared the fate of Czecho-Slovakia, and refused to abandon its sovereignty over any section of her territory. The Polish Government was willing to negotiate, and establish a common Polish-German guarantee over Danzig, and make all possible concessions to facilitate German transportations through Pomorze. This meant that Poland was willing to agree to a virtual political Anschluss between Danzig and the Reich, while reserving her vital economic interests in the Baltic. When no reply was received to these proposals, Poland realized the gravity of the danger and turned towards Great Britain and France. Meanwhile, the British Government, shocked by Chancellor Hitler's violation of the Munich agreement, decided upon a fundamental change in British foreign policy. In a historic statement in the House of Commons, on March 31, 1939, Prime Minister Chamberlain gave assurances to Poland that:

... in the event of any action which clearly threatened Polish independence and which the Polish Government, accordingly, considered as vital to resist with their national forces, His Majesty's Government would feel themselves bound at once to lend the Polish Government all support in their power. They have given the Polish Government an assurance to that effect. I may add that the French Government have authorized to make it plain that they stand in the same position as do His Majesty's Government.

The unilateral guarantee of the British Government was subsequently changed into a bi-lateral treaty of mutual assistance.

Chancellor Hitler, in his speech of April 28, 1939, before the Reichstag, denounced the non-aggression treaty with Poland of 1934, and in a memorandum sent the same day by the German Government to Poland, it was explained that the denunciation of the non-aggression treaty was the result of Poland's acceptance of the British guarantee. Colonel Beck, replying to the German demands, reaffirmed the willingness of Poland to negotiate over the Danzig and Pomorze questions, and denied that the British guarantee of Polish independence was in contradiction with the non-aggression treaty between Poland and Germany.

Incidents in Danzig and on the Polish-German frontier were multiplying during the summer 1939, and an anti-Polish press campaign was launched in the German newspapers. When, on Aug. 19, 1939, a commercial agreement was signed between Nazi-Ger-



A GERMAN INCENDIARY BOMB fired these suburban homes of Warsaw in Sept. 1939 and killed 15 occupants

many and Soviet Russia, followed by a non-aggression pact, Germany was pressing for an immediate solution of her difficulties with Poland. Chancellor Hitler agreed, through Sir Nevile Henderson, British Ambassador in Berlin, to enter into direct negotiations with Poland, if a Polish envoy with full powers would come to Berlin. Poland refused to negotiate on those conditions, and insisted that talks be held in a neutral country. The Polish Government, remembering the so-called negotiations between Schuschnigg or Hacha, and the German officials, in similar conditions, declared that no envoy who would have to sign on the dotted line would go to Berlin.

On August 31 at 9 P.M., an official communication was read over the German radio, stating that the German Government had waited in vain for two days, for the arrival of a Polish negotiator. In these circumstances, "the German Government cannot but regard their proposals as having been virtually rejected." Those proposals contained the demand for the return of Danzig to the Reich. In Pomorze, a committee composed of representatives of Great Britain, France, Soviet Russia, and Italy, was to organize a plebiscite limited to those domiciled in the territory on Jan. 1, 1918. In the event that the Corridor went to the Reich, under the plebiscite, Poland was to receive a narrow corridor connecting her to Gdynia. If Poland won the plebiscite, Germany was to get an ex-territorial road and a four-track railway line. The German proposals provided also for compensation of damages done to minorities since 1918, and for the demobilization of Danzig, Gdynia, and the peninsula of Hel. On Sept. 1, 1939, German troops crossed the frontier and a score of cities, including Warsaw, Lwow and Cracow, were bombed.

Partition of Poland: Premier Molotov, in a radio speech of Sept. 17, 1939, declared that the Polish State ceased to exist and therefore the treaties concluded between the Soviet Union and Poland, namely the non-aggression treaty of 1932, had lost all value. The Soviet Union could not "remain indifferent to the fate of its blood-brothers," the Ukrainians and White Russians. At least 1,000,000 Soviet troops marched into Poland, and met

with practically no resistance. On September 28, an agreement was signed in Moscow, between Germany and the Soviet Union, dividing Poland between the two countries.

German-occupied territory: The area is about half of the territory of the former Polish republic; is inhabited by about 21,000,000 people, of which 18,000,000 are Poles, less than 2,000,000 Jews, and about 800,000 are Germans. Contains the most important industrial establishments and large agricultural areas in the provinces of Posen and Pomorze. Culturally, the people are much more advanced than in the Russian-occupied area. Most of the large cities of Poland are situated here. German authorities have divided the territory into two sections; one, containing the provinces of Pomorze, Posen, and Upper-Silesia (which, before 1914 belonged to the German Empire), and Lodz, was incorporated in the Reich; the other, with Cracow as its capital, was made into a Gouvernement General of Poland.

Russian-occupied territory: An area of about 75,000 sq.mi., inhabited by approximately 13,000,000 people, of which 8,000,000 are Ukrainians and White Russians, 1,300,000 are Jews, and 3,500,000 are Poles; contains oil wells in Galicia, and textile industry in Bialystok; the population is overwhelmingly agricultural and very poor. Only one great city, Lwow.

In an agreement between Soviet Russia and Lithuania, the city and region of Vilna were ceded to the Lithuanian republic.

New Regime: On Sept. 30, 1939, President Mościcki resigned and appointed as his successor Wladislaw Raczkiewicz. The new President appointed, in Paris, a Cabinet, composed of representatives of all important Polish political parties, and headed by General Wladislaw Sikorski. The new Polish Government later moved to Angers (France), and was recognized, not only by the Allies, but also by the neutrals. The program of the Government is the establishment of a new democratic Poland, in which all citizens will be granted equality of rights. (See also ANTI-SEMITISM; CZECHO-SLOVAKIA; MINORITIES; SLOVAKIA.)

(S. SL.)

Banking and Finance.—(In thousands of zlotys): revenue (est. 1938-39) 2,475,000; expenditure (est. 1938-39) 2,475,000. Gold reserve (Dec. 31, 1938) 445,000; (Aug. 31, 1939) 443,000. Bank notes in circulation (Dec. 31, 1938) 1,406,000; (Aug. 31, 1939) 1,928,000. Exchange rate (1938 av.) 1 zloty=18.86¢; (Aug. 1939) 1 zloty=18.75¢.

Trade and Communication.—Foreign trade (in thousands of zlotys): imports, merchandise (1938) 1,299,600; (Jan.-July 1939) 762,300. Exports, merchandise (1938) 1,184,400; (Jan.-July 1939) 781,500. Net tonnage of shipping entered (monthly av. 1938) 542,000; (June 1939) 622,000. Net tonnage of shipping cleared (monthly av. 1938) 542,000; (June 1939) 600,000.

Agriculture, Mineral Production, Manufacturing.—(In thousands of quintals, 1939): wheat, 22,700; barley, 14,800; (1938): rye, 1,029; oats, 948; maize, 2,962. (In metric tons, 1938): coal, 38,100,000; petroleum, 504,000; pig-iron and ferro-alloys, 972,000; steel, 1,548,000. Industrial production (monthly av. 1938, 1929=100) 118; (June 1939) 127. Unemployed (monthly av. 1938) 348,000; (June 1939) 241,000.

Polar Regions: see EXPLORATION AND DISCOVERY.

Pole Vaulting: see TRACK AND FIELD SPORTS.

Police. The numerical strength of municipal police in the U.S. continues to increase. Latest figures (for 1938) covering over 2,500 cities, towns and villages, are summarized from the *Uniform Crime Reports* in Table I.

All five groups of cities above 10,000 population showed a slight increase in police quotas for 1938 over 1937. Any increase in police quotas is immediately reflected in police costs. Latest

data upon per capita costs for police are shown in Table II which is complete for all cities over 50,000 population.

Police pay-scales also continued to rise, as the salary cuts effected during the early 1930s were gradually restored to former levels.

Table I

Population Groups	Number of Forces Filing Returns	Number of Police per Thousand of Population
Group I—over 250,000	37	2.2
Group II—100,000 to 250,000	57	1.5
Group III—50,000 to 100,000	102	1.4
Group IV—25,000 to 50,000	190	1.2
Group V—10,000 to 25,000	571	1.1
Group VI—2,500 to 10,000	7,581	1.1
Totals	2,538	1.6

Table II

Population Groups	Per Capita Cost of Police—\$				
	1936	1935	1934	1933	1932
Group I—All cities over 250,000 pop.	6.06	5.84	5.65	5.69	6.06
Group II—All cities from 100,000 to 250,000 pop.	3.71	3.65	3.60	3.79	4.35
Group III—All cities from 50,000 to 100,000 pop.	2.83	2.71	2.66	2.69	3.00

New York, Jersey City, Yonkers and Mount Vernon (all located in the New York metropolitan area) continued to have the highest pay-scales, with the maximum pay for the grade of patrolman set at \$3,000 per annum in these four cities. Generally speaking, police salaries are highest in the larger cities, and lower in smaller places. From the standpoint of geographic distribution, the higher brackets are to be found in the Middle Atlantic, New England and Pacific Coast States, and along the Great Lakes, while the lowest police scales are quite definitely located in the South Atlantic and South Central areas. Thus, the level of police salaries reflects in a general way the local living costs and standards.

The latest available figures for crimes cleared (by arrest and formal charge) relate to the calendar year 1938. As in previous years, the largest percentage of offences cleared in this manner was in the group of reportable crimes against the person (murder, manslaughter, aggravated assault and rape), which ranged, in 1938, from 77.3% (for aggravated assault) up to 89.5% (for murder and non-negligent manslaughter). Crimes against property show a less favourable situation, with clearances in 1938 ranging from 22.3% (for auto theft) up to 42.5% (for robbery). The police record of crime clearances for 1938 was in general better than that for 1937, except as to larceny and rape.

Taking the country as a whole, success in solving crimes varies inversely with the size of the city, and 1938 was no exception to the general rule. It should not, however, be concluded that there is any causal relationship between the two, the whole issue being confused by the fact that both the crime rates and the police quotas of the small cities are smaller than those of the large cities. A summary of the 1938 percentage of clearances, for 1,182 cities, towns and villages with a total population of 38,462,850, appears in Table III.

England and Wales.—Increase in the numerical strength and the net cost of the police forces, noted for each year since 1934-35, was continued in 1938. The totals for recent years are shown in Table IV.

The numerical strength of the London Metropolitan Police

Table III

	Murder and Non-Negligent Manslaughter	Negligent Manslaughter	Rape	Robbery	Aggravated Assault	Burglary, Breaking or Entering	Larceny, Theft	Auto Theft
Offences Cleared by Arrest	89.5	87.1	82.5	42.5	77.3	34.7	25.3	22.3

Table IV

	Numerical Strength	Gross Expenditure
1938	63,594	£25,849,470
1937	62,804	25,096,020
1936	60,966	23,497,839
1935	60,257	22,751,377
1934	59,988	22,785,323

totalled 18,623 in 1938, which represented a decline of 263 from the preceding year. Prior to that, the force had reached levels which approached 20,000 men. The annual report of Lieutenant Colonel Frank Brook, H.M. Inspector of Constabulary, caused wide comment in police circles, particularly the statement that "the time is appropriate for a renewed plea for the merging of small forces. . . . Some of the forces are too small to justify the police administration, and cannot procure even simple police equipment. . . . The time has gone by when the Service as a whole can be handicapped by local sentiment."

As a result of a vigorously conducted Home Office experiment in the maintenance of road patrols, the Lancashire constabulary showed a 44% reduction, in 1939, in personal injury road accidents. Recruiting difficulties continued in 1939, particularly in the Metropolitan police force. Air raid precautions, for the administration of which the police have been made largely responsible during recent years, became a duty of prime importance with the outbreak of the European war on Sept. 1, 1939. At about the same time, the police were armed with revolvers, which represented a departure from established practices of long standing. Extension of regional crime laboratories by the Home Office was continued during 1938 with the establishment of the Northwestern Forensic Science Laboratory at Preston. It will serve every police force in Lancashire, Cumberland and Westmoreland.

Police reported a general increase in indictable offences during 1938 (running as high as 109% in Canterbury), and juvenile offences also gave cause for concern. On the other hand, non-indictable offences showed a tendency to decline.

Scotland.—Continued rise in police quotas and in police costs was a feature in 1938. A comparison for recent years follows:

	Numerical Strength	Net Expenditure
1938	6,887	£2,563,523
1937	6,695	2,426,439
1936	6,607	2,397,246
1935	6,556	2,295,943

Further consolidation of small police forces, long agitated in the United Kingdom, was proposed by the Scottish Office to the county councils of Wigtown, Kirkcudbright and Dumfries. Similar action was suggested with respect to the Angus constabulary and the Arbroath Burgh police.

At Comaig, on the Island of Tiree, a new police station, with electrically heated cells, was opened in 1939. Value of the new facilities was doubted by those who pointed out that no prisoners have been taken on either Tiree or Coll within the memory of persons now living.

General.—The first Congress International de Criminalistique was held in Lausanne, July 22-24, 1938. Technical papers on various aspects of police science were read by delegates from Frankfurt-am-Main, Lausanne, New York, Riga, Karlsruhe, Lille, Graz, Stockholm, Genoa, Assen, Berne, Budapest, Tallinn, Amsterdam and Berlin. In Canada, the 34th annual convention of the Chief Constables' Association was held at Windsor, Ontario, in June 1939. Greatest interest centred around a proposal that Canadian police be co-ordinated as in the United Kingdom, with the Dominion establishing standards for and contributing to the support of a system of locally controlled forces. Compulsory civil finger-printing was also discussed.

In Oct. 1939, the International Association of Chiefs of Police (in which American and Canadian memberships heavily predomi-

nate) held its 46th annual Police Congress at San Francisco. Most important action there taken involved renewed efforts to secure more adequate frequencies for police radio service, and a report by a special committee that "the residence restrictions imposed in many communities which prohibit trained, qualified and experienced persons from competing in examinations (for police appointment), simply because they do not reside within the corporate limits of the city in which examinations are being conducted, is the greatest handicap to professionalized police service."

During 1939, also, the Federal Bureau of Investigation at Washington announced the opening of the new National Police Training Center at Quantico, Virginia. Hailed as a veritable "West Point of Law Enforcement," the new plant and improved facilities will be devoted to the higher training of Federal, State and local police officers.

Important publications of the year included the *Police Blue Book*, 1939-40 (International Association of Chiefs of Police), a directory of the major police officials of 70 countries, dominions, colonies, dependencies and mandated territories, together with those of the States, provinces and leading civil subdivisions. (See also FEDERAL BUREAU OF INVESTIGATION.)

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Poliomyelitis: see INFANTILE PARALYSIS.

Political Parties, U.S.: see COMMUNIST PARTY; DEMOCRATIC PARTY; ELECTIONS; REPUBLICAN PARTY; SOCIALIST PARTY.

Polo. The first international polo between Great Britain and the United States to take place in the U.S.A. since 1930, and the first to be held anywhere since 1936, was the outstanding event of 1939 in polo. In this two-out-of-three game series for the historic International Polo Challenge Cup, held at the Meadow Brook Club in June, the United States team successfully defended the Cup by winning two straight games by the scores of 11 to 7 and 9 to 4. The United States team consisted of Michael G. Phipps, Thomas Hitchcock, Jr., Stewart B. Iglehart, and Winston F. C. Guest. Great Britain played with Robert Skene, Aidan Roark, Gerald Balding, and Eric H. Tyrrell-Martin.

The National Open championship, top event of the American season, was won by the Bostwick Field team of George H. Bostwick, Robert L. Gerry, Jr., Elbridge T. Gerry, and Eric H. Tyrrell-Martin. They defeated the Greentree team of J. Peter Grace, Jr., Robert Skene, Thomas Hitchcock, Jr., and John Hay Whitney in the final game. Greentree, however, was successful in capturing the Monty Waterbury Memorial Cup, the most important handicap tournament of the year. (R. F. K.)

Pond, Irving Kane (1857-1939), U.S. architect, was born May 1 at Ann Arbor, Mich. and was educated at the University of Michigan there. After travelling abroad in 1883-84 he settled in Chicago, where he established an architectural firm with his brother, Allen B. Pond. Among the buildings designed by this firm were the Hull House and the Chicago Commons in Chicago, the Michigan Union building at the University of Michigan, and a public hospital at St. John, N.B., Canada. He died at Washington, D.C., September 29.

Pope, Sir William Jackson (1870-1939), British chemist. Born at London on March 31, he was educated at Finsbury Technical college and Central Technical college, London. In 1901 he became professor of chemistry at the Municipal School of Technology at Manches-

ter, and in 1908 he was appointed professor of chemistry at Cambridge. His first research was in crystallography. Later he specialized in pure organic chemistry, and during the World War he made notable discoveries in connection with mustard gas and other poison gases. For his career and work consult *Encyclopædia Britannica*, vol. 18, p. 226, also the index. Sir William died at Cambridge on October 17.

Popular Front: see COMMUNISM; LABOUR PARTY.

Populations of the Countries of the World: see AREAS AND POPULATIONS OF THE COUNTRIES OF THE WORLD.

Porto Rico: see PUERTO RICO.

Portugal, area (including Azores and Madeira) 35,670 sq.mi.; pop. (est. Dec. 31, 1938) 7,460,000. Chief towns: Lisbon, capital, 594,300; Oporto, 232,280. President: Gen. António Carmona; language: Portuguese; religion: Christian (mainly Roman Catholic).

History.—Internally, Portugal in 1939 was passing through a period of reorganization conducive to greater efficiency in the public services. The Foreign Office and the Board of Trade were entirely reconstructed and the reform of the postal, telegraph and telephone services, begun in 1937, was completed. The contract was given for a new naval base to be constructed in Lisbon at a cost of £130,000. The outstanding spectacular event of the year was the February rally, in Lisbon, of 300,000 members of labour syndicates in honour of Dr. Salazar. Preparations for the commemoration, from May to Dec. 1940, of the two great anniversaries, that of the independence of Portugal and that of Portugal's final separation from Spain, continue.

The treaty of non-aggression and friendship signed with Spain on March 17, 1939 confirmed and intensified the good relations existing between the two corporative States.

On May 22, in the National Assembly, Dr. Salazar made a formal declaration that the Anglo-Portuguese alliance continued to be an unchanging principle of Portuguese policy, and the House of Commons, four days later, was informed that "His Majesty's Government for their part unhesitatingly reaffirm their determination to fulfil their obligations under this alliance."

On the outbreak of the European war, the Portuguese Government issued a manifesto, declaring its neutrality and confirming the alliance with Britain. In October, Dr. Salazar made a declaration, in this sense, before the National Assembly. On the commercial side it seems likely that Britain will recover much lost trade with Portugal. Being far from Germany, Portugal has been little affected by the war, but early in September a decree to check speculation was issued which provides for the control of imports, exports, and industrial and commercial activities, and, if necessary, the requisition of retailers' establishments and the rationing of food. (E. A. P.)

Education.—Elementary (1937) schools 7,890; scholars 734,922; secondary (1936-37) schools 45; scholars 18,055; universities (1936-37) 3; students 5,871.

Banking and Finance.—Revenue, ordinary (est. 1939) 2,029,200,000 escudos; expenditure, ordinary (est. 1939) 2,019,800,000 escudos; public debt (1938) 7,229,300,000 escudos; notes in circulation (Aug. 31, 1939) 2,230,000,000 escudos; gold reserve (Aug. 31, 1939) 920,000,000 escudos; exchange rate: 110 escudos = £1 sterling.

Trade and Communications.—External trade (merchandise): imports (1938) 2,284,337,000 escudos; (Jan.-Aug. 1939) 1,275,720,000 escudos; exports (1938) 1,140,943,000 escudos; (Jan.-Aug. 1939) 786,770,000 escudos; re-exports (1938) 412,436,000 escudos. Communications and transport (Dec. 31, 1937): roads, first and second class 8,858 mi.; railways, open to traffic 2,187 mi.;

motor vehicles licensed: cars 34,442; commercial 11,410; cycles 4,536; shipping (June 30, 1938) 261,100 gross tons; launched (July 1938–June 1939) 2,100 gross tons.

Agriculture and Minerals.—Production 1938 (in metric tons): wheat 430,100; maize 296,200; wine 10,955,000 hectolitres; coal 308,000; rye 102,900; oats 94,800; rice (1937) 84,900; barley 39,000; potatoes (1937) 596,100; olive oil 36,000; sea fisheries 224,400. (W. H. WN.)

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Portuguese Colonial Empire. Total area (approx.) 839,506 sq.mi.; total population (est. Dec. 31, 1937) 16,790,000. Certain essential statistics of the colonial possessions of Portugal, including the mother country itself, are given in the table.

Portuguese Colonial Empire

Country & Area sq. mi. (approx.)	Population est. Dec. 31, 1937 (000's omitted)	Capital, Status, Governors, Premiers, etc.	Principal Products (in metric tons)	Imports & Exports 1937 (in thousand escudos)	Road, Rail, & Shipping 1937	Revenue and Expenditure est. 1938 (in thousand escudos)
Portugal (including the Azores and Ma- deira) 35,670	7,380	Lisbon, republic, <i>President</i> : General António Carmona. <i>Premier</i> : Dr. António Salazar.				
AFRICA Angola (Portuguese West Africa) 481,351	3,250	Luanda, colony, <i>Governor-General</i> : Manuel de Cunha e Costa Marques Mano.	(1937–38) maize 260,500 cane sugar 32,500	imp. 214,897 exp. 343,773	rds. 21,388mi. rly. 1,434mi. shpg. (1936) entered, 5,330,087 tons	(est. 1939) rev. and exp. 255,990
Cape Verde Is. 1,546	166	Praia, colony, <i>governor</i> : Amadeu Gomeo de Figueiredo.	(export 1937) salt 29,843 preserved fish 325	(1936) imp. 63,583 exp. 2,845	rds. 493mi. shpg. (1936) entered, 4,508,196 tons.	(est. 1939) rev. and exp. 19,452
Portuguese Guinea 13,946	420	Bolama, colony, <i>governor</i> : Luiz António de Carvalho Viegas.	(export 1938) ground-nuts 31,500; palm and palm kernel oil, 6,900	imp. 36,642 exp. 38,535	rds. 1,714mi. shpg. (1936) cleared, 159,761 tons.	(est. 1939) rev. and exp. 30,395
São Tomé and Prin- cipe Is. 386	60	S. Tomé, colony, <i>governor</i> : Ricardo Vaz Monteiro.	cacao, coffee, coconut	imp. 20,522 exp. 46,446	rds. 169mi. rly. 10mi. shpg. entered, 868,539 tons.	rev. and exp. 12,296
Mozambique (Portu- guese East Africa) 297,729	4,280	Lourenço-Marques, colony, <i>governor-general</i> : José Nunes de Oliveira	cane sugar (1936–37) 115,100; ground-nuts (1937) 37,600.	imp. 432,769 exp. 365,257	rds. 17,970mi. rly. 1,130mi. shpg. (Beira) cleared, 4,148,118 tons.	rev. 581,839 exp. 570,119
ASIA Portuguese India 1,538	600	Nova Gôa, colony, <i>governor-general</i> : José Cabral.	fish, spices, salt.	(1936) imp. 111,543 exp. 20,508	rds. 730mi.; rly. 51mi.; (1936) shpg. entered, 2,687 vessels.	rev. and exp. 52,612
Macao 8	170	Macao, colony, <i>governor</i> : Dr. A. T. Barbosa.	fish, cement, preserves	(1936) imp. 108,158 exp. 62,818	shpg. cleared, 2,298- 285 tons.	rev. and exp. 38,746
Timor 7,332	464	Dili, colony, <i>governor</i> : Álvoro Eugénio Neves de Fontoura.	coffee, sandalwood, wax.	(1936) imp. 3,413 exp. 7,550	rds. 496mi. (1936) shpg. entered, 221 vessels.	rev. and exp. 13,411

Portuguese East Africa: see PORTUGUESE COLONIAL EMPIRE.

Portuguese Guinea: see PORTUGUESE COLONIAL EMPIRE.

Portuguese West Africa: see PORTUGUESE COLONIAL EMPIRE.

Post Office. The estimated revenues of the Post Office Department for the fiscal year ended June 30, 1939, amounted to \$745,955,075.24, which was the largest in the history of the service, exceeding by \$17,321,023.88 the previous banner year of 1938, an increase of 2.38%.

The audited expenditures for the department during the fiscal year were \$784,646,938.14, leaving a gross deficit which includes various non-postal items such as franked mail, air mail subsidy, penalty mail, and publications free in county, of \$38,691,862.90. Deducting all these non-postal items which total \$55,374,890.27, as authorized by Act of June 9, 1930, leaves a net postal surplus for services rendered for hire of \$16,683,027.37. This was the fifth net postal surplus during the past six years.

In addition to its customary functions the Post Office Depart-

ment has performed many other important public duties, including the sale of United States savings bonds, which during the fiscal year ended June 30, 1939, amounted to \$567,007,406.25.

Air Mail.—During the year 1939 both domestic and foreign air mail services showed tremendous growth. At the end of the fiscal year the aggregate length of all domestic air mail routes was 37,049mi., representing an increase of approximately 3,394mi. during the period. A total of 15,818,617,372 pound-miles of air mail service was performed as compared to 14,137,360,791 pound-miles during the fiscal year 1938. The revenues during the same period were \$16,326,358.27, an increase of 6.7% over the previous year. Within the fiscal year service was inaugurated on six new domestic routes as follows: Phoenix, Arizona to Las Vegas, Nevada; Jacksonville, Fla. to New Orleans, La.; Tampa, Fla. to Memphis, Tenn., and Tallahassee, Fla. to Atlanta, Ga.; Detroit, Mich. to Sault Sainte Marie, Mich.; Houston, Tex. to Brownsville, Tex. and San Antonio Tex.; Wichita, Kan. to Pueblo, Colo.

There was a substantial increase in the amount of mails trans-

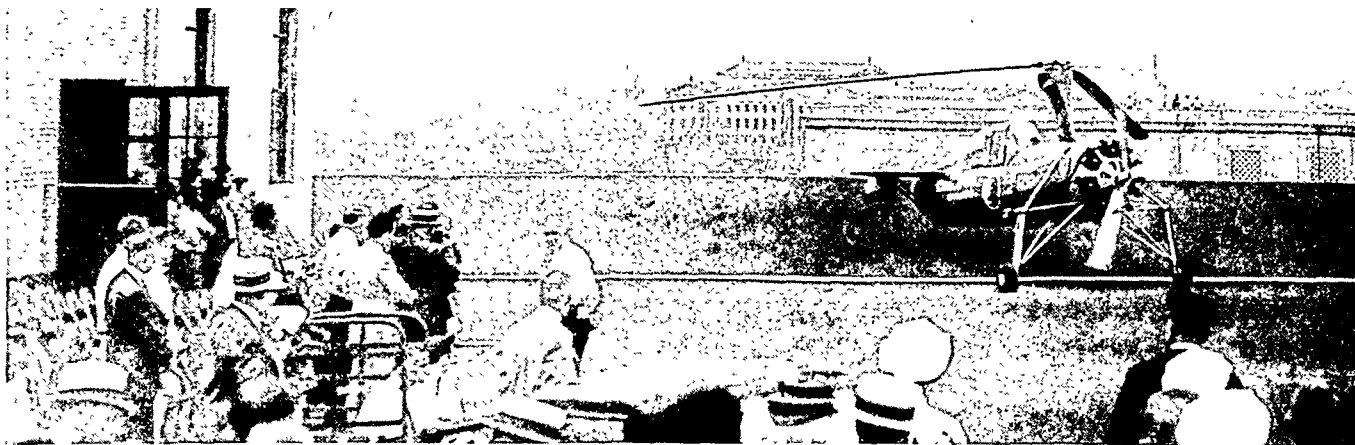
ported over foreign routes, amounting to 22.1% in mails dispatched and 19.3% in mails received. There are now 34,302.6 route miles embraced in the foreign air mail service over which 5,357,405.1mi. were flown during the fiscal year.

An important event of the year was the inauguration of transatlantic air mail service. Twice a week service was authorized on the southern route between New York and Lisbon, Portugal, and on the northern route between New York and Foynes, Ireland.

The United States Foreign Air Mail System now serves directly 93 cities in the following places: Canada, Newfoundland, Europe, Cuba, Mexico, Central and South America, Hawaii, Asia, as well as Alaska, the Philippine Islands, Puerto Rico, the Canal Zone and Guam.

Buildings.—During the fiscal year 1939, 160 new and additional Federal buildings were occupied, 13 extensions to existing buildings completed, and 16 new Federal buildings replaced a like number of old buildings which had become inadequate for Government purpose.

Nearly 400,000 people earn their living in the postal service,



AN AUTOGIRO AIR-MAIL ROUTE—first in the world—was inaugurated July 6, 1939, to deliver mail to the Philadelphia post office from Camden airport, six miles away

of which something more than 250,000 are regularly employed. (See also GOVERNMENT DEPARTMENTS AND BUREAUS.)

(J. W. Co.)

Great Britain.—The increase in the work of the British Post Office was well maintained during the year ended March 31, 1939. The delivery of letters and parcels both showed new records, the former at 8,150,000,000 (up 160,000,000 on 1938), the latter at 184,832,000 (up 9,332,000). The issue of money orders rose to 17,155,000 (up 312,000), representing a sum of £70,984,000 (up £1,483,000), while the sale of postal orders again registered a big increase, the number rising by 23,196,000 to 422,427,000, and the amount by £4,057,000 to £103,960,000—figures that again reflect the activities of the football pool promoters.

The increase in telephones—nearly 185,500, bringing the total to 3,235,500—was rather smaller than that of the previous year; effective calls totalled 2,236,000,000 (up 70,000,000) of which 2,122,400,000 were local and 111,553,000 inland trunk calls, the remainder being international. Telegrams, which had shown a fall the previous year, rose by 929,000 to 59,311,000, of which 50,396,000 were inland; the "greetings" telegrams no doubt contributed to this result, for at 4,500,000 they showed an increase of 33%.

The Post Office surplus declined by £629,942 to £9,539,588, making it necessary to withdraw £990,894 from the reserve to enable the fixed exchequer contribution to be met. Net receipts during the year were £88,452,687. The issue of a further £40,000,000 capital for development of the service was authorized by parliament in July, when it was estimated that £36,200,000 would be required for the telephone and £3,800,000 for the postal and telegraph services to cover the period ending about March 1941.

On the outbreak of war a certain amount of increased charges and curtailment or restriction of services became necessary, particularly in relation to overseas air-mails; and it is to be regretted that what was to have been a regular weekly transatlantic air-mail service had to be abandoned. It was inaugurated on June 28 by the arrival at Southampton of the Pan American Airways' flying-boat "Yankee Clipper," with 1,734 lb. of mail, and the arrival at New York on Aug. 7 of the Imperial Airways' "Caribou" with 960 pounds.

During the year newly designed stamps of the values of 9d., 10d., 1s., 2s. 6d., 5s., 10s., were issued. (See PHILATELY.)

(L. H. D.)

Potash.

The crude potassium salts output of the world is almost exclusively the chloride or sulphate, with a small proportion of nitrate and carbonate, produced primarily for fertilizer use; only a very small amount goes into industrial chemicals, and even in the United States, where the industrial demand is probably higher than in any other country, with the possible exception of Germany, the chemical salts comprise only about

10% of the total. World production decreased from 2,800,000 metric tons of K_2O equivalent in 1929 to 1,400,000 tons in 1932, increasing to 3,105,000 tons in 1938, distributed as follows: Germany 60%, France 19%, United States 9%, Soviet Union 9%, and Poland 2%; the remaining 1% comes from Palestine, Spain and several still smaller sources.

The production of potash in the United States was a World War development that has been growing steadily since the post-War slump. In 1929, five plants produced 55,900 tons, and expansion continued throughout the depression with practically no break; 10 plants produced 174,900 tons in 1935, and nine plants turned out 287,500 tons in 1938. In spite of this heavy increase in production the demand far exceeds the supply, and imports increased to 219,000 tons in 1935 and 318,000 tons in 1937, but decreased to 175,600 tons in 1938. Sales of potash salts in the United States in 1938 amounted to 869,300 metric tons, equivalent to 424,100 tons of K_2O . (See also FERTILIZERS.)

(G. A. Ro.)

Potato Beetle: see ENTOMOLOGY.

Potatoes.

Prices for potato starch advanced sharply in Aroostook county, Maine, centre of the United States potato starch industry, following the outbreak of war which prevented exports of starch from Germany, a large producer of potatoes and starch. The *Potato World* reported that Aroostook factory prices had advanced from 3½¢ in June to 6¢ a pound in October. The war demand for sand bags caused a rise in the price of bags used in sacking potatoes. An innovation in the potato trade also developed in 1939 when the Chicago Mercantile Exchange established futures trading in potatoes, similar to futures trading in grain, cotton and other commodities. Production in the United States in 1939 was given by the Department of Agriculture in preliminary reports as 358,689,000 bu., or 3% under the 1938 crop of

U.S. Production of Potatoes by States, 1938 and 1939

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
<i>Surplus late potatoes</i>			Massachusetts	2,490,000	2,041,000
Maine	40,800,000	39,600,000	Vermont	2,000,000	1,884,000
Idaho	28,080,000	28,750,000	Rhode Island	720,000	624,000
Michigan	27,825,000	30,000,000	<i>Intermediate States</i>		
New York	23,826,000	26,840,000	New Jersey	7,280,000	10,530,000
California	23,052,000	18,720,000	Virginia	6,952,000	10,349,000
Minnesota	21,510,000	20,700,000	Missouri	4,929,000	5,832,000
Wisconsin	18,128,000	19,080,000	Kentucky	3,864,000	4,635,000
Colorado	13,050,000	11,830,000	Maryland	2,250,000	2,090,000
North Dakota	11,016,000	12,070,000	Kansas	2,175,000	3,210,000
Washington	7,568,000	7,568,000	Delaware	344,000	368,000
Oregon	7,200,000	7,310,000	<i>Early potato States</i>		
Nebraska	6,020,000	6,240,000	North Carolina	8,091,000	8,690,000
South Dakota	2,325,000	1,624,000	Alabama	4,752,000	4,326,000
Utah	1,935,000	2,244,000	Florida	3,422,000	4,488,000
Montana	1,848,000	1,620,000	South Carolina	3,108,000	2,784,000
Wyoming	1,430,000	1,080,000	Tennessee	2,020,000	3,120,000
Nevada	270,000	336,000	Arkansas	2,849,000	3,400,000
<i>Other late potato States</i>			Texas	2,666,000	2,950,000
Ohio	11,800,000	12,626,000	Oklahoma	2,380,000	2,376,000
Iowa	5,432,000	5,684,000	Louisiana	2,268,000	2,752,000
Indiana	4,680,000	4,940,000	Georgia	1,482,000	1,044,000
Illinois	3,256,000	3,822,000	Mississippi	1,368,000	1,368,000
West Virginia	2,852,000	2,720,000			

371,617,000bu. and 4% under the ten-year average (1928-37) of 372,258,000. Canadian official estimates placed the 1939 crop at 38,875,000cwt., compared to 35,938,000cwt. in 1938 and nearly 6% under the six-year average. Other important producing countries showed the 1939 crop as follows, with 1938 figures in parentheses: Netherlands 93,695,000bu. (103,632,000); Hungary 86,346,000bu. (78,653,000); Finland 56,584,000bu. (44,014,000); Estonia 33,730,000bu. (36,656,000); Switzerland 24,985,000bu. (29,802,000); Italy 12,066,000bu. (13,358,000). Figures for Poland, Germany, France and England and Wales are not available, but official reports of the acreage planted to potatoes in 1939 and 1938 are: Germany 7,848,000ac. (8,046,000), including Austria and the Sudeten; Poland 7,562,000ac. (7,487,000); France 3,415,000ac. (3,521,000); England and Wales 454,000ac. (475,000). The German crop in 1938 was 1,964,430,000bu.; England and Wales 123,797,000 bushels. (See also SWEET POTATOES.)

(S. O. R.)

Poultry.

The largest production on record, both in chickens and turkeys, was reported in 1939 in the United States. Between January 1 and July 31 commercial hatcheries hatched 19% more chicks than the previous high of 1936. Increased production is a continuation of the shift from home hatching to commercial hatcheries as the source for chicks to supply both commercial and farm flocks. Since records of commercial hatcheries were first available in 1929 production of chickens has moved invariably in a three-year cycle, one year down and two years up. Production was on the increase in both 1938 and 1939. Therefore, the Department of Agriculture anticipates a probable decrease in production in 1940. Farm flocks in 1939 were about 2% larger than in 1938. There are about 400,000,000 laying hens in the United States, according to the Institute of American Poultry Industries, which estimates that breeder hatcheries and commercial hatcheries produce about 700,000,000 chicks annually. In Canada the number of chickens on farms, as of June 1, was officially reported as 58,509,800 in 1939 and 53,774,600 in 1938; turkeys, 2,476,000 in 1939 and 2,039,600 in 1938. In England and Wales on the same dates, chickens 52,738,000 in 1939 and 52,539,000 in 1938; turkeys 700,000 in 1939 and 789,000 in 1938. In Scotland, chickens 7,293,700 in 1939 and 7,380,900 in 1938; turkeys 131,100 in 1939 and 145,900 in 1938. Prices for chickens ruled lower in the United States in 1939, as, for example, in Nov. 1939, farmers received an average of 12.4¢ a pound compared to 13.6¢ a year earlier. The proportionate increase in supplies in 1939 over 1938 is indicated by stocks of frozen poultry of 81,165,000lb. Nov. 25, 1939, compared to 76,481,000lb. a year earlier. War had no effect on poultry prices in the United States, except as it may affect public buying power. During the World War (1914-18) poultry exports provided only about 1½% of the total income United States farmers received from poultry. Despite record supplies turkey prices in the United States in 1939 approximated those of 1938, owing to the fact that growers are encouraging all-winter consumption of turkeys, and not merely holiday consumption. Observance of Thanksgiving on both November 23 and November 30 by different communities in 1939 added to the demand for turkeys. (See also EGGS.)

(S. O. R.)

Pound, Sir (Alfred) Dudley (Pickman) Rogers

(1877-), British First Sea Lord, was born August 29 and was educated at Fonthill, East Grinstead, and at The Limes, Greenwich. He was in command of H.M.S. "Colossus" at the Battle of Jutland May 31, 1916, and was mentioned in dispatches for his part in the engagement. From 1922 to 1925 he was director of the Admiralty's plans division, and from 1925 to 1927 chief of staff to

Admiral Sir Roger Keyes, then commander-in-chief of the Mediterranean fleet. After two years as assistant chief of the Naval staff (1927-29) and two years as rear admiral in command of a battle cruiser squadron (1929-31), he was appointed in 1932 as Second Sea Lord and chief of naval personnel at the Admiralty. He was advanced to admiral in 1935 and the next year he was named commander-in-chief of the Mediterranean fleet. On May 17, 1939, he was appointed First Sea Lord and chief of the British naval staff to succeed Admiral Sir Roger Backhouse (*q.v.*).

Powder Metallurgy: see METALLURGY.

Power: see PUBLIC UTILITIES.

Presbyterian Church.

The Reformed Churches holding the Presbyterian System, located within the U.S.A., are twelve in number and include 18,054 ministers, 18,581 churches, and 3,984,732 communicant members. Outside of continental United States, they have 2,221 American foreign missionaries and 12,800 native workers in a total of 21 countries, and a communicant membership of 239,258.

The year 1939 among the Churches of the Presbyterian family was marked by an increased emphasis upon the evangelistic program. There was no attempt to evade or under-rate disquieting features of church life, yet every effort in church activities indicates a turn in the tide which is most heartening. Several of the larger denominations reported the greatest net increases in church membership in the last ten years.

A world aspect was given to the spirit of church unity when the General Assembly of the Presbyterian Church in the United States of America elected as its Moderator, Dr. Sam Higginbottom, a British citizen, president of Allahabad Christian college, and one of the most widely known missionaries in the world. In addition, that body received with marked approval reports from its Department of Church Cooperation and Union regarding the negotiations in 1939 with the Protestant Episcopal Church and the Southern Presbyterian Church. Invitations were issued to the Reformed Church in America and to the United Presbyterian Church to confer upon closer co-operation, and a message was received from the Methodist Commission on Interdenominational Relations inviting the General Assembly to resume the negotiations toward union interrupted pending completion of union of the three leading Methodist churches in the United States.

Plans were carefully made for the first General Synod of the newly created Evangelical and Reformed Church to be held in June 1940. These plans, necessitated by the union consummated in 1938, include the mode of operation, and the scope of activity of congregations (officers and members), synods, boards, educational and benevolent institutions and commissions.

Eleven changes in the Confession of Faith of the Presbyterian Church in the United States (Southern) were finally approved, a number of others proposed being rejected. Two overtures which would revise the Confession of Faith and the Larger Catechism of the Presbyterian Church in the United States of America to make more clear the Christian right of conscientious objection to military service in the event of war, received the approval by a majority of the presbyteries, but failed of the required approval of two-thirds of the presbyteries. This vote should not be regarded as indicating the attitude of this Church toward war itself. A meeting of real significance in the relation of the Presbyterian and Reformed churches to the Oecumenical Movement was that of the Western Section of the World Presbyterian Alliance in Feb. 1939.

Europe.—In spite of the outbreak of war, the year 1939 among the Presbyterian Churches of Great Britain was marked by an inner unity and an evangelical solidarity. New opportunities and grave responsibilities were created by the changed situation. Wel-

fare services to meet war needs, the interruption in the education of town children and the disruption of family life due to their evacuation, the disturbance of local parish routine by the black-out, and the induction of so many young men into the military service, were some of the problems confronting the churches.

The movement which in 1939 united the various Reformed branches to form the Reformed Church in France was most providential in grappling with the vast refugee problem created by the war. Many of the 500,000 people evacuated from the frontiers are members of this church. The Waldensian Church in Italy celebrated in September with elaborate ceremonies the 250th anniversary of the return of the Waldensians to their homeland.

In other parts of Europe the principal Reformed (*i.e.* Presbyterian) Churches have experienced—in common with the churches of other confessions—sufferings and persecutions unparalleled in modern history. The religious balance of 1939 showed a tremendous deficit in church membership, in the loss of church property and influence, and in the decrease of pastoral and educational forces of religious character.

Meagre reports from Poland revealed chaotic conditions among the scattered congregations. The Church in Galicia and the Ukrainian Evangelical Reformed Church remained in the darkness behind the iron curtain of Russian occupation. In Germany, the church faced danger in methods of intimidation which are tempting it with an ideology alien to its message. (W. B. P.V.)

Pre-School Children, Education of: *see* EDUCATION: *Nursery Schools.*

Presidents: *see* SOVEREIGNS, PRESIDENTS AND RULERS.

Prices. **Prices of Commodities at Wholesale.**—Following the outbreak of war in Europe in September, wholesale commodity prices rose sharply in most of the countries for which information has continued to be available. Germany is a marked exception, as is clear from the chart on p. 549 comparing the movements of wholesale price levels since 1933 for the United States, Great Britain, and Germany. The sharp, widespread, and concerted rise of prices which began in September contrasts with a small and somewhat uncertain upward movement of prices for about a year after the outbreak of war in Aug. 1914. There were also important differences in the economic conditions preceding the outbreak of war in 1914 and in 1939. There was a world depression in 1914; whereas, in 1939 the business situation was more diversified. Industrial production was expanding in the United Kingdom and France, while in the United States there had been a dip in output in early 1939. Again, collectivism was a more important factor in the latter period than in the former. Thus, the German economic program in recent years includes price controls, the effects of which are clearly evident in the chart.

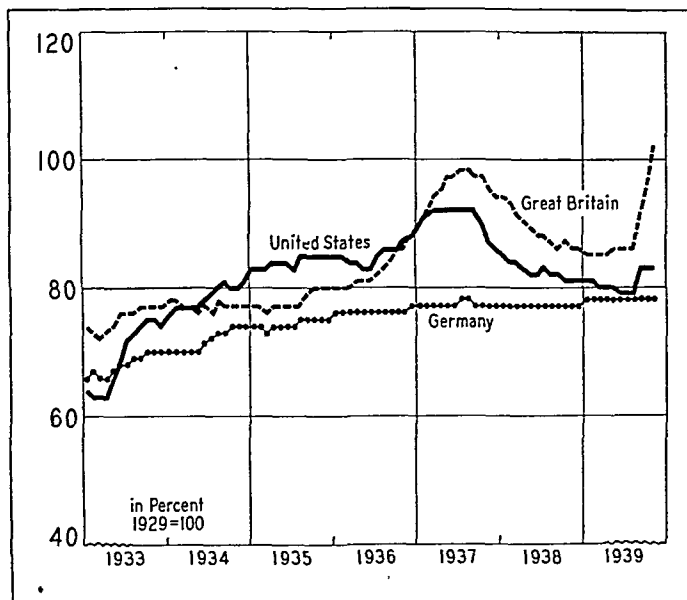
In the period before Sept. 1939, war had been a price-disturbing factor. The Abyssinian war contributed to the rise of prices in Italy during 1935. Beginning in 1937 the Chinese war was a factor in the upward trend shown by the Japanese price index.

In the months preceding Sept. 1939, international exchange rates had undergone various wide fluctuations, while prior to Aug. 1914, exchange rates were fixed within narrow limits by the gold standard. Sterling exchange declined in New York about 6% in the latter part of 1938. This tended to support the level of British prices in early 1939. The declining value of the yen in 1938 was a minor factor in the increase in the Japanese price level, which is shown on the chart on p. 550. Price movements in other countries have been more markedly affected by depreciating exchanges in recent years. The French wholesale price level has more than doubled since 1935. The declining value of the

franc in 1936, 1937, and 1938 contributed to the increase in the French price level during these three years. Sharp declines in Belgian exchange early in 1935 and in Italian exchange late in 1936 were partly responsible for the concomitant increases in wholesale prices in these countries. When the war broke out in 1914, American securities held abroad were dumped on the New York market and sterling and franc exchange rose sharply. This tended to delay price increases in Great Britain and France. In Sept. 1939, England and France husbanded their external credits, and sterling and franc exchange depreciated, and exchange depreciation contributed to a sharp rise of wholesale commodity prices. The rise of wholesale prices in England, as well as in countries from which she buys extensively, reflects also a much more rapid industrial mobilization for war than took place in 1914. Although price levels rose slowly at first, after the declaration of war in 1914, the rise was eventually both sharp and extensive. The memory of this war-time rise was itself a factor in the quick response to the outbreak of war in 1939.

United States.—The sharp, concerted rise of wholesale commodity prices in the United States following the outbreak of war in Europe in Sept. 1939 contrasts with the uncertain price movements during the preceding year-and-a-half. As the chart reveals, this uncertain period had been preceded by a precipitate decline in the prices of farm products and foods during the sharp business recession which began in the latter half of 1937. The decline in industrial prices during this recession was slower and considerably smaller than that in agricultural prices in spite of an unparalleled drop in industrial production.

The period of uncertain price movements was a period of business uncertainty. During the latter half of 1938 business experienced a marked recovery, to which some commodity prices responded while others did not. Early 1939 saw a mild decrease in the volume of business. Reflecting in part these business movements, a temporary check in the downward trend of the level of prices of farm products and foods in the latter part of 1938 was followed by a number of further commodity price declines in 1939. The downward movement of hog prices was halted only temporarily during 1938, and under pressure of increased supplies resumed in 1939, until in August a level of 6¢ a pound was reached. After a temporary rise in the fall of 1938, sugar declined to a low of 4.2¢ a pound in the following June. Prices of cotton and of beef cattle fluctuated uncertainly over this period, the former between 8¢ and 9½¢ a pound and the latter between 9¢ and 10¢ a pound. With a repetition of large wheat and corn crops in 1938, wheat prices fell to a six-year low at 65¢ a bushel in late 1938, and corn prices declined to 45¢ a bushel. With smaller crops, wheat prices strengthened somewhat during the spring and summer of 1939 while corn prices remained at a low level as production was maintained. The relatively stable level of the industrial price index during the 15 months preceding the outbreak of war reflects mixed movements among individual commodity prices. Prices of a number of commodities rose under the stimulus of expanding business activity during the latter half of 1938 and remained relatively stable throughout the early part of 1939. Southern pine lumber prices increased from slightly over \$21 per 1,000 bd.ft. to \$25; scrap steel from less than \$12 a ton to \$15; copper from 9¢ a pound to 11¢; and rubber from 12¢ a pound to 17¢ during the latter part of 1938. Most of these gains were maintained through the following months. Various commodity prices followed other patterns. Silk prices, after rising during the latter part of 1938 to \$1.80 a pound, continued upward as demand expanded in the face of a limited supply, reaching a level of \$3.90 a pound by the end of 1939. Prices of cattle hides rose to 14¢ a pound in Nov. 1938 and declined to less than 10¢ in the first half of 1939. Prices of finished steel,



OFFICIAL INDEXES OF WHOLESALE PRICES IN THE UNITED STATES, GREAT BRITAIN, AND GERMANY (all converted to 1929 as a base)

passenger automobiles, and petroleum declined in the latter part of 1938.

At the outbreak of war there was a concerted rise of prices in which most important commodities participated. Exceptions were brick, cement and coal, the prices of which have been relatively stable for several years at levels slightly below those of 1929, and finished steel, passenger automobiles and petroleum.

Although industrial production reached 1929 levels during the latter part of 1939, the level of industrial prices remained during this period somewhat below the peak reached in 1937. Southern pine reached a peak of \$31 per 1,000 bd.ft. in Oct. 1939 and declined somewhat thereafter. Likewise, prices of scrap steel and cattle hides reacted during the last two months of the year after reaching a peak in October, the former falling from \$21 a ton to \$18, and the latter from nearly 17¢ a pound to almost 14¢. Copper, however, rose to 12¢ a pound and rubber above 20¢ a pound, and during the last quarter of 1939 these levels were maintained.

After increasing sharply in September in anticipation of an enlarged war-time export demand, the prices of a number of agricultural commodities reacted during the last quarter of 1939. The price of beef cattle eased slightly after reaching 10¢ a pound. Hog prices declined from 7½¢ a pound to 5¢, a five-year low. Sugar, which had been below 4½¢ a pound in August, rose sharply to over 5½¢ a pound in September and subsequently declined again nearly to 4½¢ in December. Prices of wheat and corn likewise reacted during October from their September highs, but rose during the last weeks of 1939 to over \$1.00 a bushel and 57¢ a bushel, respectively, in response to reports of drought. Cotton prices rose over the entire period, to 10¢ a pound in December.

Great Britain.—During recent years the pattern of price movements in Great Britain has, in general, been similar to that in the United States. But there have been significant differences. The heavy demand for industrial raw materials under the rearmament program (as well as the weakening of the pound in the latter half of 1938) helped to moderate the downward trend in the level of prices between mid-1937 and the spring of 1939. In early 1939 prices averaged well above the level of 1936, while in the United States the early 1939 level was below that of 1936.

However, prices of both foods and industrial goods in Great Britain averaged lower in the early months of 1939 than at any time in 1937 or 1938. Steel prices which had remained firm during the 1937-38 industrial recession were belatedly cut at the

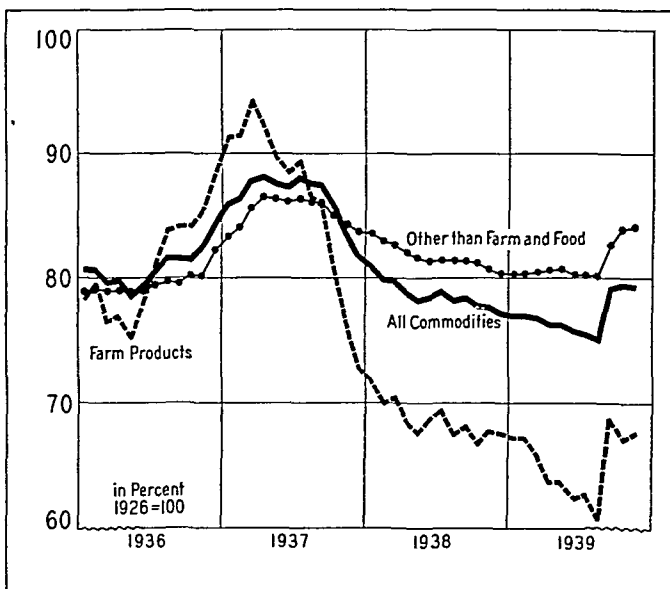
beginning of 1939, the price of rails declining from £10 to £9½ per ton. The price of copper rose in the latter half of 1938 and eased during the first half of 1939. Prices of building timber, which went below £16 per standard in Jan. 1939, and hides, which went below 5d. a pound in December and January rose sharply during the spring. Wheat and barley continued downward in early 1939, wheat to slightly over 4s. per cwt. in March and barley to slightly over 6s. in July. Mutton and sugar prices rose in the latter part of 1938 and early 1939, contrary to the general trend.

Following the outbreak of the war in September, wholesale commodity prices rose sharply. In November the level was about 120% of that of August. This marked rise took place in spite of the fact that a wide variety of commodities were subjected to supply and price controls, and in many cases maximums were established beyond which prices could not rise.

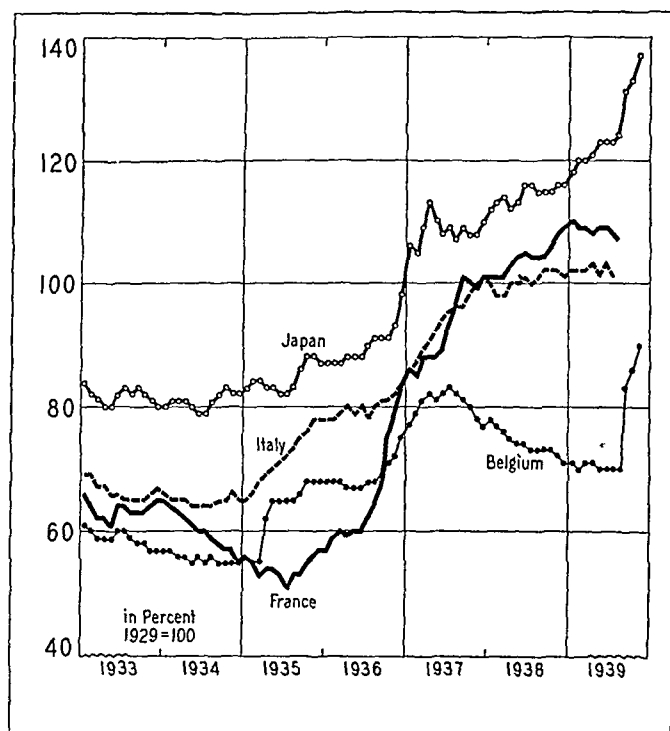
As a general rule, prices of foods were allowed to rise more than prices of industrial materials. Wheat and barley prices rose gradually, reaching over 7s. per cwt. and 15s. per cwt., respectively, during December. Granulated sugar prices, which had increased to 23s. per cwt. before the outbreak of the war, increased to 36s. in early October and remained at about this figure. Prices of Argentine beef and English mutton increased only slightly, however, before stabilizing at 70s. per cwt., and 88s. per cwt., respectively, in late September.

Maximum prices were set for the non-ferrous metals during mid-September which allowed for little or no increase in the prices prevailing before the declaration of war. Copper prices were set at £51 a ton, lead and zinc prices at about £17 a ton, and tin prices at £230 a ton. Subsequent difficulties with supply, resulting in part from marked price increases in other major industrial countries, brought about a revision of these prices during December. The maximum price for tin was removed altogether and the price rose to over £270 a ton and then receded somewhat. The maximum price for copper (including duty and delivery cost) was reset at £62 a ton, and that for lead and zinc at about £25 a ton.

Iron and steel prices were allowed to return to about their 1937-38 levels late in the year, with steel rails going to about £10 a ton and Cleveland pig iron to 108s. a ton. Prices of building timbers remained at about £24 per standard from late in September through the balance of the year. Among other industrial commodities, moderate increases were allowed from time to time,



INDEXES OF WHOLESALE PRICES IN THE UNITED STATES: Bureau of Labor Statistics



OFFICIAL INDEXES OF WHOLESALE PRICES IN FRANCE, ITALY, BELGIUM, AND JAPAN (TOKYO, BANK OF JAPAN) (all converted to 1929 as a base)

hides rising to over 8d. a pound in December, rubber to about 12d. a pound, American cotton to nearly 9d. a pound, wool tops to nearly 32d. a pound, and Welsh coal to over 27s. a ton. (See also AGRICULTURE: *Wars and Prices*; COST OF LIVING; FINANCIAL REVIEW; and articles on individual commodities.) (M. A. Co.)

Prices, Commodity: see AGRICULTURE; PRICES.

Primary Education: see EDUCATION, ELEMENTARY.

Prince Edward Island, the smallest but the most densely populated province in Canada, lies in the Gulf of St. Lawrence in the shape of a crescent, its inner side towards the north. It is nine miles from the mainland. Across the separating strait, powerful ice-breaking ferry-boats ply in winter and summer carrying railway cars, automobiles, passengers and freight. There is also a daily air mail and passenger service connecting with trans-continental Canadian Airways. The island is 137mi. long, and varies in width from 2 to 32 miles. It contains 2,133 square miles. The population, Canadian census 1931, was 88,038; estimated Dec. 31, 1939, 91,000 of which 81% is rural. Charlottetown, the capital, 12,361; estimated Dec. 31, 1939, 13,000. Of the island's population 80% are of British descent; 14% French; 42% are Roman Catholic and 58% Protestant, of which 28% are of the United Church, 18% Presbyterian; and 6% Anglican. The Legislative Assembly consists of 30 members, 2 from each of 15 electoral districts.

To Dec. 31, 1939 the estimate of revenue was \$1,900,000; estimated expenditure, ordinary, approximately the same; capital expenditure including provision for sinking fund \$800,000, of which interest absorbed \$300,000. The Dominion subsidy was approximately \$650,000. Of the revenue, \$370,000 went to education, the total cost of which was \$555,000. Pupils enrolled were 18,600; cost per pupil \$30; teachers 710; average salary \$502. The public debt Dec. 31, 1939 was approximately \$6,000,000; per capita \$68. Income, real estate and succession taxes are moderate.

The main occupations are agriculture and fishing; 485,000 acres are under cultivation. The capital investment in agricultural in-

dustry in 1939 was \$53,460,000; in manufacturing industry, \$2,400,000. The estimated total value of farm products in 1939 was over \$12,000,000; potatoes (approximately) 5,800,000bu.; turnips 4,000,000bu.; oats 4,800,000bu.; wheat 320,000bu.; hay and clover 401,000 tons; butter 1,850,000lb.; cheese, 450,000 pounds.

The estimated value of fisheries was \$650,000; oysters 900,000lb.; estimated fox pelts, 80,000, valued at \$1,800,000. There is little serious crime, and practically no illiteracy. (Cy. M.)

Princeton University during 1939—its 192nd year—improved its curriculum, in pursuit of a policy of meeting the needs and aptitude of the individual undergraduate.

Continuing to cut new doors in the academic walls which divide departments, it applied to the social sciences, through reorganization of undergraduate instruction in the School of Public and International Affairs, the principle of cross-departmental specialization that had been previously tested in the humanities. Thereby it opened up, as a single field of selection for individual programs, the whole range of the social sciences.

Among new research projects was the establishment of the Princeton Listening Center to record and analyze war propaganda broadcast by European nations. Gifts received totalled \$1,581,624.84. Enrolment, which is controlled by a policy of limitation, was 2,714, of which 299 were graduate students. The teaching staff numbered 403. (H. W. Do.)

Principe: see PORTUGUESE COLONIAL EMPIRE.

Printing. Perhaps the most striking and important development of the year in the printing industry took place near the end of 1939. As a result of this development, printing ink, heretofore invariably in thick liquid form, is made available in powdered form with indications of very definite advantages. It is put into the enclosed ink fountain of the press, which is heated. The press rollers, preferably of rubber or synthetic rubber, take the ink, now in liquid form, from the fountain and apply it to the curved plates on the press cylinder, which is also heated to keep the ink liquid. The very instant the warm ink strikes the relatively cold paper, however, it dries. This obviates off-setting, that is, ink of a printed sheet not yet dry smudging the next sheet or opposite side of the roll.

There is not only the advantage of improved quality but presses may be speeded up when no allowance for time for drying is necessary.

This so-called "cold-set" method follows closely upon another development in inks known as "heat-set," "Vaporin," and by other names. As the term implies, drying of ink by the latter method is hastened by the inks being quick-drying themselves but especially by application of heat to the sheets instantly after printing. "Heat-set" inks were a decided boon to magazine publishers and merchandisers requiring large catalogues with pictures in full colours on smooth paper because they permit faster production and because they are a protection against offsetting. Developers of the powdered ink (cold-set) claim, and the claim appears reasonable, that it represents a further advance.

The offset (the term is not to be confused with the word as used above), or planograph, method of printing continued advancement, especially in the newspaper field. The Trenton, New Jersey, *News-Advertiser* which in 1938 adopted offset for pictorial sections in monochrome, ordinarily done by rotogravure, has progressed in the use of this kind of printing. It now prints such sections in full natural colour, having done so since early in 1939.

A new all-offset daily paper was announced during 1939 from Hartford, Connecticut. A number of so-called "country" news-

papers turned to offset. The lure is pictures of more detail than is possible by the regular letterpress method with stereotypes cast from regulation copper photo-engravings.

In process of development for several years, a new method of machine typesetting advanced materially toward the practical stage during 1939. Speed is apparently its chief advantage. It is reliably said that the machine composes type at the rate of 14,000 ems an hour. If it maintains this rate under actual shop conditions later on, it will prove to be considerably faster than present types of composing machines. Other factors, like cost of the type, will have an effect on the economy of the system. Instead of the product being one piece for a complete line or a combination of single letters, full type height (.918 inch), type is like just the top part of the letter, say $\frac{1}{8}$ -in. high, in short quite similar to the steel types used on the common multigraph machine. These are caused to drop in place in a grooved base (which makes them type-high) by striking keys for the different letters and characters just as the linotype is operated, although the keyboard is that of the standard typewriting machine and not that of the linotype.

The year witnessed a gigantic show of printing equipment at Grand Central Palace, in New York city. While all items showed progress, few were of major importance or indicated any decided change.

Worthy of note was the development in making plates for offset by projection. Ordinarily a negative is made from the copy, photograph, or painting to be reproduced, of the size the printing plate must be. By the new method the negative may be very small and the plate very large, the negative being projected upon the sensitive press plate as a lantern slide is projected upon the screen. By the older method the negative was "printed" by contact with the press plate just as films are printed on paper in amateur photography. By the projection method, small Kodachrome films may be blown up to tremendous dimensions, saving a great deal in negative costs. The photographic equipment in great size is being made up for the army to be used in making giant-sized maps. (See also NEWSPAPERS.) (J. L. F.)

Prisons. During 1939, new buildings were constructed, or were in the process of construction, in some prisons of the United States. At the Kansas State penitentiary, a three story structure was added to the institution to house the kitchen, commissary, and school. The Arkansas State penitentiary built an up-to-date hospital, and two new dormitories exclusively for Negro inmates. At the Arizona State prison, two new dormitories also were erected; one within the walls, and the other, designed for trusties, outside the walls. Colorado State penitentiary completed a maximum security cell block, and has just commenced the construction of a new dining room to accommodate 1,400 men.

Two large duplex dormitories were built at the Connecticut State Farm for Women, while at the Maine State prison, a new wing was added to the cell block. The California State prison at San Quentin had a fireproof industrial building under course of construction to house the following industries: shoe, clothing, furniture, and printing. At the Kentucky State penitentiary, a new kitchen, dining room, cold storage plant, garage, and three cell blocks were being built.

In New York State, a maximum security prison was being erected at Green Haven. Earlier in the year, the cornerstone of the Church of St. Dismas, the Good Thief, was laid at Clinton prison, Dannemora. This structure, one of the first of its kind in the United States, will have a seating capacity of 1,200, and its construction, including the shaping of the native field stone and the fashioning of the altar and pews, has been entrusted to the prisoners.

Although New York State has previously provided its penal in-

stitutions with psychiatrists, psychologists, and an adequate personnel for its prison schools, recent cuts in the budget have virtually wiped out these departments. Consequently, segregation of various types of criminals will now be largely impossible since the specialists trained for that work are no longer associated with the prisons. Thus, the effective accomplishments of the past ten years are practically vitiated.

In North Carolina and Texas, however, much progress has been made in the classification and segregation of inmates. And of particular importance is the fact that in these States the maintenance of prison camps makes this work much easier, because prisoners most amenable to reform can be sent there. Alabama State prison also undertook in 1939 the scientific classification of all inmates.

At the Rhode Island State prison, the dungeon formerly used to discipline intractious inmates has been eliminated. This section consisted of an ordinary cell with a solid wooden door covering the usual grille door. Prisoners confined there were fed entirely on bread and water, and given a regular meal but once every five days.

The wooden door has now been removed and regular rations substituted.

During 1939, the Federal Government appropriated \$14,000,000 for the repair and construction of Federal penal and correctional institutions. Nineteen projects were approved which included the construction of a medium security prison in Indiana; farms for short term prisoners in Colorado, Connecticut, Kentucky, and Texas; and additional hospital and other facilities at many of the units now comprising the Federal prison system. Work on these projects was started in 1939, and most of them will be completed very shortly.

At the annual meeting of the American Prison Association, Alexander Patterson, His Majesty's Commissioner of Prisons for England and Wales, reported on the British system of handling offenders under 21 years of age. These youthful inmates are not confined in prisons with older and hardened criminals, but are sent to what are known as Borstal Institutions. There are nine such institutions, and their populations range from 100 in the smallest, to 300 in the largest. Because of these small inmate quotas, the officials can more easily and effectively rehabilitate their charges.

As for European penal activities, little information is available because of the war. However, in England and Germany, men whose sentences ran three months or less, were released to engage in military service or other war operations. (L. E. L.)

Pritchett, Henry Smith (1857-1939), U.S. scientist and educator, was born in Fayette, Mo. on April 16, the son of Prof. Carr W. Pritchett, a distinguished teacher who founded Pritchett college at Glasgow, Mo. Henry Pritchett graduated from his father's college in 1875 and the next year began the study of astronomy at the U.S. Naval Observatory under Asaph Hall. In 1878 he was appointed assistant astronomer at that observatory, and two years later he returned to Glasgow as chief astronomer of the observatory there. From 1883 to 1897 he was professor of astronomy and director of the observatory at Washington university in St. Louis. President McKinley appointed him superintendent of the U. S. Coast and Geodetic Survey in 1897, and in this position he introduced civil service for the first time into the bureau and conducted several important investigations of the American coastline. He resigned in 1900 to accept the presidency of Massachusetts Institute of Technology. Six years later he was selected as president of the new Carnegie Foundation for the Advancement of Teaching, which office he held until his retirement in 1930. He died at Santa Barbara, Calif. on August 28.

Prizes: see LITERARY PRIZES; NOBEL PRIZES.

Processing Tax: see COTTON.

Progressive Education: see EDUCATION, PROGRESSIVE.

Progressive Education Association: see ACADEMIC FREEDOM; EDUCATION, PROGRESSIVE.

Propaganda. In war-time, the conquest of public opinion is sometimes as important as victory in the field; and especially in this age of total warfare, when the conflict is not so much between armies, fighting on distant fronts, as between whole nations. Of all the lessons of the World War (1914-18), this was, perhaps, the one that Adolf Hitler took most to heart. The ex-army corporal would not, or could not believe that Germany was ever defeated in the field: "the Fatherland collapsed behind the lines, slowly, under the withering fire of Allied propaganda," wrote Adolf Hitler in *Mein Kampf*. On assuming the Chancellorship, he, therefore, made the Ministry of Propaganda and Public Enlightenment an integral part of Germany's war machine. If his armies were later to walk into Austria, Sudetenland, and Czecho-Slovakia almost without opposition, it was partly because Dr. Paul Joseph Goebbels had been successful in undermining opposition first, not only in those nations, but throughout Europe and in the United States, as well.

The United Kingdom and France were slow to realize this; but apparently the law of diminishing returns operates in propaganda, too. Herr Hitler's technique was always the same—to shame the Allies by talk of the iniquities of Versailles; to gain their sympathy and support by holding Germany up before the world as the only bulwark against Communism; to disrupt the nations of central Europe by propaganda-inspired movements for *Anschluss*. It worked for nearly six years; but eventually it became an oft-told tale, which annoyed many and convinced few. Then, in one swift move, Herr Hitler shattered the myth of his undying enmity for Communism. Seemingly, his object was to frighten England and France into acquiescence now that his propaganda could no longer seduce them. He failed. On September 1, war broke out in Europe.

In the United States the post-war years of disillusionment had served to make the people only too aware of the power of propaganda. A nation, which had gone to war to make the world safe for democracy and to insure everlasting peace, saw only dictatorship and militarism in Europe. Studying the history of America's participation in the war, as described by Walter Millis, Oswald Garrison Villard, H. C. Peterson, Senator Gerald P. Nye, and many others, millions became increasingly convinced that the U.S. had been duped into fighting—perhaps by the Allies, or by "Wall Street," perhaps by the "Merchants of Death," but certainly by propaganda. The very word seemed enough to frighten them. On the whole they were not so much afraid of German propaganda, however; six years of National Socialism had made the name Adolf Hitler anathema in the United States, and even the Germans hoped to achieve little more by their propaganda than strict American neutrality as defined in the Neutrality Act of 1937.

Quite naturally, this allergy to Allied propaganda heartened the German propagandists. Seeking to counteract it, the Allies hastened to assure the American people that it was not their intention to carry on propaganda in the United States. In the words of Lord MacMillan, one-time Minister of Information, their attitude was that "We are content with Hitler as our propagandist." It was said that no lecturers would be sent to the U.S., as lecturers were sent by Sir Gilbert Parker in the World War (1914-18). Later, when lecturers did begin to come, they insisted that arrangements for their visits had been made long before the invasion of Poland. However, in the *New Statesman and Nation*, H. G. Wells revealed that semi-official suggestions had been made to him to visit the United States. Apparently, the assurance that "We are not carry-

ing on propaganda" was itself propaganda, designed to allay suspicion. It was coupled with the assurance that England and France were fighting the fight of democracy against totalitarianism, law and order against the rule of force. A United States of Europe led by the democracies would result if the Allies were victorious, Americans were told.

Official documents rolled from the presses, as each government sought to place responsibility for the war. Germany charged that England, alone, was responsible, absolving France. The French, it was said, had been willing to negotiate at the last moment, while the German armies were already well into Poland. Over and over, the French were told in short-wave radio broadcasts: "England will fight until the last Frenchman." This attempt to divide the Allies by propaganda was unsuccessful; and their official documents agreed that Germany had been offered the chance to negotiate but would not accept it, preferring unconditional Polish surrender or war. Planes of the Royal Air Force roared into Germany, peppering the Reich with handbills which called on the people to overthrow the National Socialist régime.

Then, Adolf Hitler launched his so-called peace offensive, with the help of the Soviet Union. This was designed further to absolve Germany of war-guilt, for, even though Herr Hitler knew that peace was impossible unless the German armies withdrew from Poland, the German propaganda-machine described the rejection of his offer as conclusive evidence of the Allies' desire for war. The Soviet propaganda-machine chimed in, saying that if Germany had been the original aggressor, the roles were now reversed.

More and more, as the war progressed, Soviet propaganda began to echo the German. The non-aggression pact between the Soviet Union and Germany represented no quicker right-about face for Herr Hitler than it did for Josef Stalin. Ever since 1935, the Soviet Union had sought to line up the democracies against Germany, denouncing National Socialism, denouncing attacks on smaller nations, praising democracy, and distinguishing between the imperialism of England and France and the imperialism of the Reich. Now that Germany and the Soviet Union were friends, if not allies, Soviet propagandists had to sing another tune. The democracies were as reprehensible as Germany; indeed, the democracy of England and France was only "sham." American foreign policy, which the Soviet propagandists had formerly praised, became "war-mongering." As the Red Army marched on Finland, they joined with the Germans in ridiculing the announcement of the Allies that Austria, Czecho-Slovakia, and Poland would some day be reconstituted in one form or another. The right of smaller nations to exist, which, for 20 years, they had so ably defended, it was now convenient to forget.

Important volumes which appeared on propaganda during the year 1939 included:

H. C. Peterson, *Propaganda for War* (1939). Peterson skillfully analyzes steps taken by the British Government to break down American neutrality in the period 1914-17.

Sidney Rogerson, *Propaganda in the Next War*, London (1939);* Rogerson wrote just prior to the war which began in Sept. 1939. He set forth propaganda policies which England should follow in the expected war. He emphasized especially what should be done to break down American neutrality in the expected war.

James R. Mock and Cedric Larson, *Words that Won the War* (1939). Mock and Larson review the work of the Creel committee during America's participation in the World War (1914-18). They show that the American Government had a monopoly of propaganda and of the various channels through which propaganda flowed to the American people. They indicate that in any new war there will be another Government monopoly of propaganda with the chief executive at the head of it.

Adolf Hitler, *Mein Kampf*, complete and unabridged, fully annotated, Reynal (1939). Also, unabridged edition, Stackpole & Son (1939). The two unabridged editions of Hitler's *Mein Kampf* brought to Americans for the first time, a clear picture of Hitler's propaganda methods. Considered in connection with his accomplishments since 1933 in building a strong Nazi Germany, these methods reveal Hitler as perhaps the greatest propaganda genius of modern history.

*First published 1938; reprinted 1939 and given its first big publicity in 1939.

Volume II, *Publications of the Institute for Propaganda Analysis, Inc.* (1939). The Institute's second published volume represents an attempt to illustrate analytical methods set forth in its first volume published in 1938. The chapters in volume II are devoted to the following: The Munich Plot; The Attack on Democracy; Communist Propaganda, U.S.A.—1939 Model; Propaganda in the Schools; Father Coughlin: Priest and Politician; Britain Woods America; Spain: A Case Study; The Associated Farmers.

Institute for Propaganda Analysis, *The Fine Art of Propaganda*, edited by Alfred McClung Lee and Elizabeth Briant Lee (1939). In the *Fine Art of Propaganda*, Doctors Lee define and illustrate the seven common propaganda devices as these have been set forth by the Institute for Propaganda Analysis: Name Calling; Glittering Generality; Transfer; Testimonial; Plain Folks; Card Stacking; Band Wagon. Specifically, most of the illustrations in the book reveal how Father Charles Coughlin, the radio priest, used the devices in his radio sermons and addresses.

American attention in 1939 was focused on propaganda, not only as a result of the European war but as a result also of the work of the so-called Dies Committee—a Congressional committee to investigate "un-American activities." The committee revealed numerous Communist and Nazi activities and propagandas. Some significant activities and propagandas, notably those of the Christian Front and Father Coughlin, were analyzed by *The Nation* of New York. Its revelations were documented further in an address by its editor, Freda Kirchway before the Institute of Human Relations at Williamstown, Massachusetts. An account of the Williamstown Institute discussion of propaganda and democracy appeared in *Survey Graphic*, for Nov. 1, 1939. (C. R. Mr.)

Proteins: see BIOCHEMISTRY: *Proteins*.

Protestant Episcopal Church. In the Episcopal Church the year 1939 was one of quiet work and of effort to maintain and strengthen the spiritual life of the church in the midst of the present world-wide anxiety and distress. The continued financial difficulty and depression in the United States was reflected in the situation of the Church in regard to its Missionary work both in the U.S. and in Europe. At the opening of 1939 the church found itself confronted with a deficit of \$300,000 in its budget for General Missions but as a result of a special campaign most of this amount was raised and the church was thus saved from the serious reductions in its expenditures for its missionary work which would otherwise have been necessary.

The Forward Movement inaugurated by the General Convention in 1934 continued its work and has given its efforts largely to the circulation of devotional and religious literature throughout the church.

An event of much importance, and one widely observed during 1939, was the 150th anniversary of the adoption of the Book of Common Prayer. During the whole of its history in the United States from the beginning, the church had faithfully used the Book of Common Prayer and had fully recognized its authority as the official standard of doctrine and worship, but in 1789 the Prayer Book was officially adopted by the Protestant Episcopal Church as autonomously organized after the War of Independence. The preface of the Prayer Book as thus adopted by the Episcopal Church declares that "this church is far from intending to depart from the church of England in any essential point of doctrine, discipline, or worship; or further than local circumstances require."

The official reports for 1939 show a total of 2,157,000 baptized persons, an increase of 46,801 during the year, and a total of 1,466,598 communicants, an increase of 26,630. (W. T. M.)

Prunes: see PLUMS AND PRUNES.

Psychiatry. During the year 1939 the active treatment of the psychoses, particularly schizophrenia, begun a few years ago, was carried out to a greater extent than ever before. The hypoglycaemic shock treatment was continued, although in a modified form. In addition to insulin shock, metrazol was used extensively, as well as narcosis therapy. The original insulin treatment by Sakel is now largely supplanted by the so-called "block" method of treatment, in which a series of insulin treatments leading to coma are combined with an equal series

of metrazol treatments associated with paroxysmal seizures. These treatments are given alternately. In addition, prolonged insulin coma has been used, up to 12 or more hours. The effect of this type of treatment cannot be evaluated at the present time. One can only say that shock treatment of any type has been effective in schizophrenia. Many patients are now reported as free from symptoms. Relapses, however, are common and the treatment often has to be repeated. It would appear, after a period of five years since Sakel introduced his insulin treatment, that only a few patients have been cured by this method. In many the duration of the illness has been decreased and the periods of remissions greatly extended. In clinics all over the world patients are being treated by the coma or convulsive form of treatment. It will take, however, a decade before a final report can be given in regard to the actual value of this type of therapy.

A similar form of treatment is that known as narcosis therapy. This treatment consists of the use of narcotic drugs to induce sleep for the greater part of 24 hours, on successive days, for periods ranging up to 14 days. The modern use of this treatment dates from the report of Kläsi in 1922. It is used chiefly in the treatment of schizophrenia. It has not increased the recovery rate of the disease, but it does curtail the duration of the psychotic condition and makes the administrative care of chronic psychotic excitement more manageable.

In contrast to the forms of treatment outlined above, new surveys of ordinary hospital treatment have been made by psychiatrists in order to correlate their results with the results of more active forms of therapy. It has been found that patients with schizophrenia under ordinary hospital conditions recover in a period of three years, at a rate of about 33%. About 50% remain in the hospital at the end of this period. These results are not as good as those following treatment by continuous narcosis, hypoglycaemic shock or metrazol.

Another form of treatment for schizophrenia has been brought to the attention of psychiatrists by Myerson and Tillotson. This is known as the "total push" method. In general, patients with chronic schizophrenia, hospitalized for many years, are treated intensively with physiotherapy, irradiation, exercises, games, special diets and psychological methods. Particular attention is paid to their clothing and they receive praise, blame, reward, or punishment according to their actions. The results of this simple method have been encouraging and it is believed by the authors that even if the insulin and metrazol methods are used, the "total push" method should be instituted in its fullest sense as an important adjunct.

The operation on the frontal lobes first suggested by Moniz in 1936 has been carried out in a number of clinics, largely for symptomatic treatment of tension, apprehension, anxiety, depression, agitation, etc. One report indicates that 15% of the patients were greatly improved and 50% moderately improved. The operation has not been widely accepted, but appears to have considerable merit.

In 1937 Lehmann-Facijs described a chemical test of the blood, which he had found positive in a large percentage of cases of schizophrenia. Realizing that schizophrenia is not a definite disease entity but only describes a group of patients with certain symptoms, he nevertheless, in testing large numbers of patients with psychoses, found that 88% to 92% of those with schizophrenia gave a positive test, whereas less than 40% of other types of patients showed changes. The other types of patients, moreover, suffered almost exclusively with destructive diseases of the nervous system such as multiple sclerosis, tumour and types of degeneration. A further report from the same clinic in 1938 indicated that the test appeared to be of even more value in the diagnosis than originally supposed. In other clinics where the test has been

used it has also proved to be unusually positive. One clinic reports positive reactions in 91% and another in 100%. The test, however, cannot be evaluated until more data are collected from various clinics throughout the world.

An important step in the legal aspects of psychiatry was taken by the State of New York when the lunacy commissions were abolished. Under the old system the court appointed a three-member advisory committee consisting of at least one qualified psychiatrist and one lawyer. Defying public opinion, judges appointed their relatives, political district leaders and other followers. The new law, which went into effect in 1939, substitutes for the lunacy commission a board of three psychiatrists, who pass upon the question of the sanity of the defendant at the time of the trial, an important point, for the psychiatrists are not required to determine the mental condition of a defendant at the time of the commission of a crime; in other words, they are only requested to state whether or not the defendant is able to understand the proceedings of a court trial. This law, known as the Desmond law, should have a wide influence as a guide to future legislation. (See also NERVOUS SYSTEM.)

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Psychical Research. During 1939, experimental investigations in psychical research were, in the United States, devoted to further research in extra-sensory perception (ESP). The early controversial phase of this research has shown a marked decline, accompanied by a general recognition that the research problems fall specifically within the field of psychology. Three symposia on ESP research methods scheduled by psychological societies have indicated this trend. The Southern Society for Philosophy and Psychology, meeting at the University of North Carolina, was the first to hold a symposium arranged by research workers who had used the methods under discussion. Recognition of ESP as a psychological problem has tended to limit research methods to the techniques of the university laboratory. Knight Dunlap (University of California) and six other experimental psychologists, in a recent article, proposed standardized test methods many of which had already been in use in the Duke Parapsychology Laboratory. Rhine (Duke) proposed a number of requirements for a mechanical selecting and recording device for ESP tests. Greenwood (Duke) introduced a mathematical technique to correct possible exaggerated probability values from optional stopping of experimental series. Studies in possible sources of error in recording techniques were continued by Kennedy (Stanford).

Murphy and Taves (Columbia) presented four different ESP test situations to their subjects, and found that even though no significant deviations occurred for the total results, the variations in correct response to the four tasks were positively correlated. Pratt and Woodruff (Duke) carried out a 60,000 trial series with college student subjects, in which they found that scores did not vary with the size of the symbols used. This experiment, conducted under the most stringent conditions for the exclusion of alternative hypotheses yet attempted in ESP research, yielded significantly positive evidence for extra-sensory perception.

An interesting approach to the theory of ESP is offered by the philosopher, O. L. Reiser (Pittsburgh). Reiser bases his theory upon the notions of emergent evolution, non-Aristotelian logic and a hypothetical psychic ether. He concludes that clairvoyance and telepathy are emergents in the process of development of a "world mind."

Whately Carington of the Society for Psychical Research (London) renewed his quantitative study of mediumistic trance personalities. In his experiments, the same "communicating" personalities were produced by different mediums. Word association tests were given the mediums in the trance state and the normal state, and similarities and differences calculated. John Hettinger studied the "ultra-perceptive faculty" of mediums by statistical evaluation of their responses to pictures and reported positive conclusions.

Recent summaries of the field of psychical research include *Beyond the Senses* by Charles Francis Potter, *Fifty Years of Psychical Research* by Harry Price and *A Cavalcade of the Supernatural* by Harold H. V. Cross.

The death in 1938 of Professor William McDougall, co-editor with J. B. Rhine of the *Journal of Parapsychology*, was a distinct loss to psychical research. Editorship of the *Journal* was taken over in 1939 by Gardner Murphy of Columbia university and Bernard Riess of Hunter college. (See also PSYCHOLOGY.)

(J. B. R.)

Psychoanalysis: see PSYCHIATRY.

Psychology. Today the field of psychology as a whole is characterized by a catholicity of interest and activity in keeping with the tremendous scope of its subject matter. Reports of research at the 1939 annual meetings of the American Psychological Association ranged from accounts of the influence of pressure upon the polarity potential of the human eye to a field study of the acculturation of second-generation Italians. In spite of the diversity of interests three major areas of concentration are discernible. The broad domain of learned modifications of behaviour is being thoroughly explored. A second area comprises research upon the chemical or internal environment of the organism and includes experiments upon drug and hormone effects. Finally there bulks large the development of methods for dealing scientifically with the social relations of man.

The Conditioned Response.—In an effort to retain the preciseness of a mechanistic view of man and still keep the common sense of a purposive conception, a dichotomy has been established between two types of conditioned response. Type A is the old Pavlovian conditioning which the behaviourists made their central principle. For example, an indifferent stimulus (such as a sound) if presented immediately prior to an adequate or unconditioned stimulus (such as a puff of air in the eye) will in time evoke the response (the eye wink), even though unaccompanied by the adequate stimulus. In Type B instead of simple stimulus substitution, a response which brings reward (such as pressing a lever which releases a pellet of food) is soon learned as a means of obtaining the reward. Type A emphasizes a mechanical association of two stimuli in time with the one stimulus acquiring the motor discharge of the other. Type B emphasizes the law of effect, and calls attention to the motive of obtaining a reward or of avoiding a painful stimulus. Experimentally much more rapid conditioning can be obtained in Type B than in Type A.

Nevertheless it seems unwise to infer two distinctive processes since Type A and Type B refer to different experimental situations. In the first type the situation is oversimplified and conditioning as mere linkage is the logical result. In the second type the situation is more complex with some measure of problem solving involved. Logically this latter process may be a quantitative complication of the former.

Experimental work, moreover, shows that the two types of conditioning are not alien even from the point of view of motivation, for the unconditioned or adequate stimulus in Type A has the same reinforcing or activating function as has the reward or punishment in Type B. If the unconditioned stimulus is not occasionally reintroduced, the conditioning dies out—a phenomenon known as experimental extinction. Now Culler, Finch and Brogden have shown that experimental extinction does not occur if another stimulus is used as a reinforcing agent, even though this new stimulus does not itself become conditioned. The presence of some strong stimulus to keep open the nervous pathways within the organism is more important than mere external contiguity for both types of conditioning.

Other recent experimentation in conditioning includes the following findings:

- (1) Conditioned responses which are invariably reinforced during training extinguish more rapidly after training than do responses which are irregularly reinforced. Human subjects who received an air blast on the eye 100% of the time during training did not maintain as high a level of performance as did subjects who received only 50% reinforcement.
- (2) Though the conditioned response is fairly consistent in a given individual, different individuals show qualitatively different patterns of response under the same experimental conditions even in the relatively simple reaction of the eyelid to light.
- (3) Sensory preconditioning has been definitely established. W. J. Brogden paired light and sound stimuli, neither of which evoked any overt responses from the experimental animals. Then the light stimulus was presented simultaneously with shock until the light alone produced withdrawal. Finally the previously paired sound was used alone and this, too, evoked conditioned withdrawal.
- (4) Conditioned salivary responses can be built up to configurations of stimuli as well as to simple stimuli. G. Razran has demonstrated conditioning to patterns or ratios of light or sound even though the component stimuli of the ratios did not themselves call out the conditioning.
- (5) Pavlov's method of producing experimental neurosis in dogs has been extended to other species and the neurotic behaviour has been more thoroughly studied. N. Maier has reported that rats whose previously established conditioned discriminations are thwarted will exhibit such abnormal response patterns as intensive tics, running in circles, and varying degrees of coma.

Effects of Drugs and Hormones.—The cumulative effect of contemporary research on drugs, chemicals and hormones has been making itself felt both upon the trends of psychological experimentation and upon the explanations of developmental and behavioural processes. The apparent success of many hospitals in the use of metrazol and insulin in treating schizophrenic patients has stimulated investigations of the effects of drugs upon the action of the nervous system, upon mood, and upon conduct. A number of investigators report that metrazol produces its convulsive effects through stimulation of centres in the brain stem. If certain stimulating drugs are used in conjunction with metrazol, sensitivity to metrazol is increased. On the other hand, the so-called brain stem narcotics increase the tolerance of patients to metrazol, whereas the bromides do not inhibit the convulsion. Insulin affects the nervous system through lowering the oxygen utilization of the brain. In one experiment the phrenic nerves of cats subjected to at least ten days of treatment with convulsive doses of insulin were removed. Measurement of the after-potentials, when these nerves were stimulated, showed that the more severe the insulin convulsion the longer the after-potential.

Benzedrine sulphate, used medically in the treatment of narcolepsy, certain depressive mental states and similar conditions, has been the subject of considerable psychological research. B. F. Skinner and W. T. Heron report that after several days of extinction a conditioned response in a rat was restored to its full extent by the administration of benzedrine. Experimenters agree that this drug enhances subjective feelings of well-being. Boredom, resulting from the carrying out of repetitive monotonous tasks, has been counteracted by small doses of benzedrine sulphate and ephedrine hydrochloride. E. Reifenstein and E. Davidoff report also the following major effects of this drug: general stimulation of mental processes, enhancing of the speech function, and an acceleration of motor functions. On the other hand, these

investigators emphasize the general nature of the effects and the difficulty of predicting how any given individual will react, because paradoxical effects which reverse the above picture are not impossible.

More important, however, than studies of drug effects are the investigations of hormones, the chemical products of the endocrine glands; for the whole internal chemical state of the organism is maintained by the functioning of the endocrines. On the physiological side the isolation and chemical characterization of hormones is proceeding successfully. The present emphasis is upon the more difficult problem of the interrelationships of the hormones, especially in the field of sex. On the psychological side research is accumulating concerning the relation of sex hormones to mood and conduct. N. Miller has studied clinical cases of castration and senile prostatic hypertrophy during treatment with the male hormone substance, testosterone propionate. In general the patients not only reported stronger sex desire, but most of them changed from states of depression to states of elation with regression to their original pattern during periods of control injection. In particular the castrates under treatment exhibited more rational aggressiveness and less irrational irritability. R. T. Sollenberger found that the behavioural changes during adolescence are related to the male hormone. In a group of 30 boys the degree of maturity of interests and attitudes varied with the amount of male hormone found in the urine. The specific effect of testosterone propionate as the instigator of sex behaviour has appeared in a number of studies. C. Stone, for example, produced precocious sex behaviour in young rats by the injection of the male hormone.

Social Functions.—Advances have been made in the methodology for studying complex questions of motivation and behaviour which have significant social implications and which cannot always be brought into the laboratory. F. H. Allport and his students have developed an observational approach which emphasizes two criteria: (1) teleonomic description or the characterization of actions in terms of their purposive aspect; (2) the recording of these acts on telic scales previously constructed by psychophysical methods. The latest study from this school is a systematic exploration of the relations between obedience to the law, ideological conceptions of the law, and effect displayed toward laws. In general the dissociation between behaviour, ideology and effect is marked, but for certain individuals an institutional view of the law was associated with law-abidingness.

Another attack upon social problems is the application of psychoanalytic concepts in modified form to normal social relationships. For example, in the recent work, *Frustration and Aggression*, appears a systematic formulation of hypotheses inspired by Freud and Adler and so stated as to permit of experimental and observational test. In this system aggression is viewed as the result of frustration and its overt manifestation is a function of the degree of frustration and the severity of the anticipated punishment. A radically different methodological approach is furnished by the techniques of factor analysis developed by L. L. Thurstone. The purpose of factor analysis is to find by statistical means the number of unitary factors which lie back of any series of correlated measures. It is a tool for seeking answers to such questions as: What factors can be analyzed out of the data on delinquency as independent and primary? Basic to factor analysis is the assumption that measures which correlate highly with one another are saturated with the same common factor. By the use of this method Thurstone has found 12 primary mental abilities which account for the scores made by a group of over 200 students on a battery of 57 mental tests. The first seven factors Thurstone identifies definitely as spatial, perceptual, numerical, verbal relations, memory, words (single words) and induction. (See also

NERVOUS SYSTEM; PSYCHIATRY; PSYCHICAL RESEARCH; PSYCHOLOGY, APPLIED.)

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Psychology, Applied. The trends apparent in the field of applied psychology in 1938 were emphasized and intensified during 1939. There were many evidences of an increasingly strong inclination to rely upon controlled research rather than upon proclamations based only on dramatic examples. A healthy tendency towards self-criticism manifested itself in a number of articles dealing critically with basic methods and in a growing insistence upon statistical verification of validity instead of a tacit assumption that methods were producing results. Technological publications from the warring nations showed a definite trend toward a concern with military problems as well as a marked impress from the ideology of the countries involved. The outbreak of hostilities in Europe caused the abandonment of plans for an international psychotechnological congress. There was, however, intensive discussion of topics in applied psychology at the annual meeting of the American Association for Applied Psychology and at the Seventh International Management Congress.

Accidents.—Although figures for accident-fatalities in 1938 had dropped slightly below their anticipated level, there was no slackening of effort in investigating the causation and possible prevention of accidents. Data from all countries continued to demonstrate that accidents are not uniformly distributed through the population but that a group of *accident-prone* individuals incurs more than an anticipated share of accidents. Attempts to determine in advance the characteristics of those liable to accident proneness have resulted in tests which are useful in selecting commercial drivers but are of dubious value in licensing the general population. Preliminary studies gave increasing hope that the tests might be used educatively to warn drivers of their shortcomings and thus reduce an accident-toll which internationally has reached dramatic proportions.

Attempts to study the causes of accidents pointed unmistakably to human failure as the source of primary responsibility. Improvements in highways were found to reduce accident rates only as they reduced possibilities of human failure. Beyond this, it was found that accidents ordinarily result from a complex of causes in which it is difficult to detect a single condition as primarily responsible. Extensive researches showed that accident-rate varies with age and that youthful drivers, while scoring high on many tests of mechanical performance, incur accidents with a disproportionately high frequency. Attempts were being made to test large numbers of drivers for alcoholic content of the blood at specified hours, so that a base might be established for the investigation of drinking as a factor in accidents. Until this has been done, figures on "drinking drivers" can cast but little light on

the role of alcohol in accident-production.

Aviation.—Except for a few investigations of the effects of low oxygen and high altitudes, relatively little has been done since the close of the World War to study the manifold psychological problems in aviation. The year 1939 saw an international rebirth of interest in these topics. Reports from Spain, Rumania, Germany, England and the United States indicated that psychologists were again being invited to concern themselves with the task of aiding in the selection of aeroplane pilots. Responsible executives in commercial and military aviation were confronted with the fact that proper selection of candidates might greatly reduce the cost of training pilots and markedly decrease the accident rate. There were signs of wide-spread dissatisfaction with arbitrary standards long accepted and an inclination to establish new standards by direct investigation.

Efforts were being made to establish a battery of tests from which a combined score might be used to predict later success in flying. As in automobile driving, it was obvious that mere aptitude in handling the controls would not be adequate and that certain other aspects of behaviour must be measured. In the European countries the problem was almost entirely under military sponsorship. In the United States, however, a nation-wide program of research was set up in conjunction with the proposal of the Civil Aeronautics Authority to train 11,000 student pilots. This program, under the auspices of the National Research Council, involved a series of integrated researches dealing with the selection and training of civilian pilots.

Industry.—Where investigations of a decade or two earlier had been focused upon improving the working environment and standardizing the movements of the worker, researches reported in 1939 followed the trend of recent years in stressing the socio-psychological reactions of the worker. The most recent publication from the long-term studies in the Western Electric Company again emphasized the high importance of the social identification of the worker with his work. Reports of this investigation, now spread through three books and a number of articles in professional journals, constitute a volume of evidence to show that shortcomings in the working environment may be more than outweighed by an intelligent company policy adequately grasped by workers who are truly identified with their jobs. Findings based upon an extensive survey in a cocoa works in England served further to verify this basic contention.

As a corollary to these studies of job-satisfaction, efforts to use the most advanced techniques of psychology in selecting workers to fit the openings available were widely reported. In France, eight major laboratories were following a standardized procedure which based its tests upon thorough job-analysis and upon adequate testing of the tests themselves, with results that showed a marked effect in reducing accident-rates. The National Institute of Industrial Psychology in England published accounts of the broad scope of its testing activities, many of which were designed to deal with the more complex aspects of human personality. In the United States, professional meetings brought out numerous papers on specific activities in industrial selection, including reports of progress from the United States Employment Service in its attempts to develop a "horizontal" classification of jobs. A classification of this type will classify jobs in terms of their psychological requirements, cutting across vocational lines in a search for psychological uniformities.

Market Research and Advertising.—With the expenditure for advertising reaching astonishing proportions, an association of advertisers sponsored a volume summarizing the present status of methods that have been proposed for measuring the effectiveness of advertisements. This revealed a half-dozen major methods in current use, each with its ardent sponsors and each with certain

weaknesses that are apparent to an objective observer. The evidence suggests that it is much easier to develop some measure of the influence of a total marketing campaign than to obtain a precise index of the effectiveness of a single advertisement. Methods proposed ranged from the photographing of eye-movements during the reading of a magazine, through checks on the identification of slogans, and included various ways of determining the relative frequency with which typical respondents reported that they read a certain advertisement. In connection with the latter method, initial data were published on the development of a formula to deal with the recognized human tendency to report having read advertisements not yet published. There was a strong suggestion that critical psychologists were moving to abandon the vague term "measuring effectiveness of advertising" in favour of a direct specification of what each particular method actually yielded.

In more than one country, intensive research in these commercial fields brought to a high level of accuracy a purely non-commercial device—the poll of public opinion. Earlier polls had suffered severely from improper sampling, crude wording and inadequate safeguarding in the interpretation of results. When those trained in the precise methods of market research took over the task of sampling public opinion, the gain was at once apparent and the poll today has become a commonplace in the daily newspaper. (See also ADVERTISING; MARKETING.)

Vocational Psychology.—It is apparent from many publications of 1939 that the civilized world at large has recognized a duty to provide aid for its youth in finding suitable employment. Perhaps the most characteristic international note of the year in this field was that of critical self-inspection within the group concerned with vocational orientation. From many centres came critical articles which stressed the need for facing the more important shortcomings of the movement. There was increasing emphasis on the necessity of checking statistically the results of guidance programs, instead of assuming that any program must be helpful. Tests, it was frequently pointed out, are important aids to the counsellor but do not constitute in themselves any more than one aspect of a total program. Studies of youth brought out additional data to show that there is a wide disparity between the vocational choices of youth and the vocational opportunities available. Many counselling centres reported specific findings to demonstrate that vocational maladjustment can be markedly reduced by a long-term program, adequately safeguarded and conceived in the light of local opportunities under existing national and international conditions. (See also PSYCHOLOGY.)

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Public Health Engineering. Air Sanitation.—Increasing interest continues to develop in the physiological aspects of ventilation of enclosed spaces as contrasted with the purely physical conditions. At Yale university systematic studies of the physiological reactions of subjects to modification of each of the basic physical factors, temperature, humidity, movement and radiation to surrounding walls, are being continued. An attempt has been made to fix the physical limits of the rather intangible property "pleasantness" in a room air. Within the region of ordinary home and office conditions, pleasant-

ness seems to be closely associated with skin temperature and this in turn with certain relations between air temperature and surrounding wall temperature (radiation effect). The relative humidity within this region has little effect upon the sensation of pleasantness.

A somewhat different approach to this question is made by Bedford and Warner of the Industrial Health Research Board and London School of Hygiene and Tropical Medicine. Essential conditions to a feeling of freshness are found to be lower rather than higher temperature, humidity not over 70%, air movement variable rather than fixed, both as to direction and velocity, walls cooler than air, and freedom from objectionable odours. Neither the ordinary changes in electrical conditions (ionization) nor the presence of small quantities of ozone affect the sensation of freshness.

The sterilization of air by the use of ultra-violet light is being rather rapidly developed in the direction of hospital wards and operating rooms, cold storage rooms for the prevention of mould growths and other commercial uses.

Housing.—Present interest in housing lies in the financing and sociological aspects although sanitation plays a large part in the housing problem. In contrast to the emphasis now so frequently placed upon artificial illumination, even to the suggestion of windowless homes and factories, this report emphasizes the importance of orientation and fenestration of buildings with respect to natural daylight. The sun's rays provide thermal, visual, physiological, psychological, and bactericidal effects.

Water Supply.—*Bacillary Dysentery.* With the general improvement of the water supplies of the world, there appears to be increasing evidence of water-borne bacillary dysentery, presumably previously masked by the high rates of typhoid and para-typhoid infections. The Office of Public Hygiene (League of Nations) reports continued increase in reported cases in Great Britain since 1934, mostly of the Sonne or the Flexner type. In the U.S., minor outbreaks are reported with increasing frequency.

A committee of the American Water Works Association in a preliminary report indicates the frequency of water-borne outbreaks, most of which have resulted from inadequate protective devices or improper control methods.

Ozone.—Renewed interest in ozonization of public water supplies is indicated in a paper before the Inst. of Water Engineers by George Baxter and by the subsequent discussion. When electrical energy is not too costly ozonization appears to be preferable to chlorination on several grounds.

Fluorine and Dental Caries.—Interest in the significance of fluorine in water supply, as a cause of a dental disfigurement known as mottled enamel, has been increased by a recent publication of Dean, *et al.*, who find on the basis of extensive studies in Illinois (U.S.), that fluorine appears to be partially preventive of dental caries.

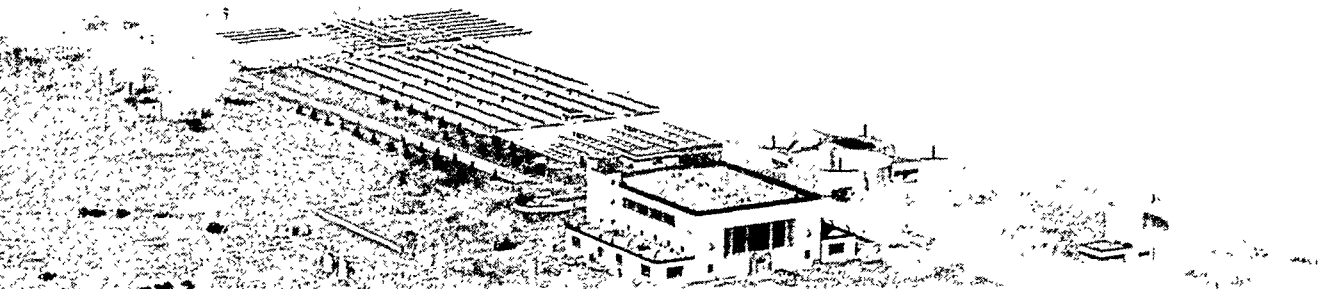
Sewage Treatment.—A significant trend of the time in sewage treatment is a return to the long abandoned aim of valuable by-product recovery. At present, not only is sludge recovered as a useful and valuable by-product but, what is more important, power is being generated from the sludge digestion gas in sufficient quantity for pumping the sewage, heating and lighting the premises, and, at times, for aeration, the most expensive item in the activated sludge process. A further development has recently been announced in Middlesex county, England, whereby this gas is being compressed in cylinders and utilized in motor vehicles. The Mogden treatment plant produces over 150,000 cu.ft. of methane per day, equivalent to about 700 imp. gal. of gasoline and having a value, under present conditions, of about \$95,000 a year.

Aviation and Mosquitoes.—The International Health committee has had under consideration the possibility of the transportation of *Aedes* mosquitoes by aeroplane. In a study of planes arriving at Durban, Natal, Ross reports the recovery of live mosquitoes in 28 out of 84 planes examined, after routine treatment with oil spray. He concludes that there is definite danger of introducing yellow fever by this route.

Recreational Use of Natural Facilities.—In the U.S. many new problems in sanitation have arisen through the use of the "trailer," a house on wheels carried about the country behind an automobile and detached for overnight or more lengthy stops at trailer or road-side camps or elsewhere. So popular has this type of vacation convenience become that elaborate arrangements are provided for them in the form of camp grounds, and local authorities have promulgated special rules and regulations for their control. Minimum requirements are a suitable water and milk supply, adequate waste disposal, drainage, toilet, bathing and laundry facilities. The spread of disease is facilitated by these constantly interchanging groups and its prevention calls for special diligence.

An allied problem is the recreational use of public land in general and in particular of water-shed areas serving public water supplies. The desirability of permitting bathing, boating or fishing in or upon reservoirs is being more frequently debated, and has recently been dealt with in a symposium of papers before the American Water Works Association.

Garbage and Waste Disposal.—The ever present problem of garbage and waste disposal is apparently being studied with renewed activity in many places, despite the favourable and almost general acceptance of high temperature incineration—the principal objection to which appears to be its cost. At Manila, a serious fly nuisance has resulted from the practice of dumping despite all precautions, and the monthly *Bulletin of Health* recommends a study of the Baccari system (fermentation). In the U.S. the latter system has been tried experimentally but the only definite trend



NEW SEWAGE DISPOSAL PLANT at Tallman's Island, New York city, as viewed from the air in Feb. 1939

away from incineration has been in the direction of the "sanitary fill" method. This consists in dumping in prepared areas and quickly covering and compacting under several feet of soil, generally excavated from a pit ahead of the dumping face. This process is being extensively developed in New York city. It appears to be quite successful except for slight local objection.

Hog feeding, the other American practice, appears to be definitely associated with human trichinosis. In a recent survey Wright finds indications of a widespread, sub-clinical infection, trichinae having been found in about 17% of 3,000 human diaphragms from routine hospital autopsy. The rate among Jewish cases (134) was 0.7%.

Further evidence against the feeding of garbage is found in a study of Feldman on tuberculosis in garbage-fed swine. Examination of 264 such carcasses resulted in a finding of 75 with tuberculosis lesions. From these, 47 cultures of tubercle bacilli were recovered, 35 of the avian type, and 12 of the human type.

It is indicated that tuberculous poultry are perhaps of more common occurrence than has been generally recognized and that city garbage has certain hitherto unverified if not unsuspected potentialities for disease transmission.

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Public Health Services. Countries with highly centralized powers have highly centralized health organizations, with supreme authority in all health matters, while in other countries, such as the United States of America, for example, local health powers are retained by the constituent States or provinces. Recent advances made by the various public health services follow a similar pattern, and relate principally to the improvement and expansion of present health administration, better training of public health personnel, intensified attacks on specific diseases, the adoption of nutrition as a public health problem, greater attention directed to infant, maternal and child care, and the enactment of some form of health security legislation.

While the health services of the various countries continue the basic public health activities of quarantine, environmental sanitation and immunization procedures, they are expanding the scope of their public health activities. Facilities for special training courses are being provided by the public health services of many countries.

In certain parts of Europe symptoms of dietary deficiency diseases are reported among the rural populations. The appearance of cases of night blindness and skin affection attributable to vitamin A deficiency has been noted among the rural population of several countries, and rickets is reported to be wide-spread in the children of these populations in southern Europe. Dietary surveys were being made in 1939 by the health services in Great Britain, Belgium, Finland, France, Hungary, Norway, Sweden and Yugoslavia. The United States Public Health Service and State and local departments of health of that country are devoting attention to nutrition. The recognition of the ill effects of an inadequate diet in the health of pregnant and nursing women, on the normal physical development of children, and possibly on resistance to disease has resulted in the development of a program of nutrition education. In 1939 the United States Public Health Service reported the discovery of a new vitamin (riboflavin) de-

ficiency disease in man which had probably existed in the United States for many years.

A national health survey made in the United States reported in 1939 that more than 800,000,000 days of disability were occurring annually as the result of chronic diseases. The public health services of several countries are directing greater efforts to discover the aetiology of such diseases as cancer and rheumatic heart disease.

In many countries the public health services are attempting to secure a wider dispersion of health, medical and hospital facilities, and various forms of health insurance and collective medicine have been adopted. It cannot be said that they have all been successful. The British Ministry of Health reports that the Insurance Medical Service was working satisfactorily in Great Britain. By an act which became effective there in 1938, young persons 16 years of age and over became eligible for the benefits of the service, increasing by approximately 1,000,000 the number of persons entitled to the services of their chosen doctor, as was previously the case with their elders. The number of persons covered by health insurance in England and Wales was about 18,000,000 in 1935.

In western Canada the "municipal doctor" system has been found to work efficiently. The municipal doctor is paid a salary and is allowed to make charges for services to non-residents. It is said that he makes an ideal health officer because he finds it to his advantage to use to the fullest extent possible all preventive measures.

The French physicians maintain that the system adopted in France of providing medical care and hospitalization is abused by persons well able to pay for such services and that the indemnities allowed by the social insurance system for sickness and maternity cases are insufficient. A bill has been introduced providing for stricter control of hospital admissions.

The proposal for a national health insurance scheme in Australia was abandoned in 1939 because of the fear that the financial burden would stifle normal development, as it came simultaneously with an enlarged defence program, and also because of the general unpopularity of the act. The 1938 Social Security Act of New Zealand provides for medical services and indemnification for sickness.

The Public Health Service of the United States proposes Federal aid to the States for medical and hospital care and is already giving assistance to the States through Federal grants-in-aid for preventive medicine. These grants-in-aid are for strengthening and expanding State and local health services and improving the technical qualification of their personnel. Many State health departments have created special divisions of industrial hygiene and venereal disease control, have intensified efforts directed to the control of such diseases as tuberculosis and pneumonia, and have increased the number of full-time health services in rural areas by more than 130%. Adequate treatment for venereal diseases is being brought within the reach of more patients, clinical facilities are being expanded, and a larger number of syphilitic patients are being brought under treatment in the early stages of the disease when the outlook for cure is most favourable. During

the fiscal year 1939 approximately \$10,500,000 of Federal funds was allotted to the States for the improvement of their health services.

In France, the use of toxoid against diphtheria is reported successful over a period of several years, and it is stated that the disease has practically been eliminated in the French Army. A law making diphtheria vaccination in school children obligatory was promulgated in France in 1938 and a similar law is in effect in Hungary, Rumania and the city of Geneva, Switzerland (also in Poland before the occupation of that country).

In Germany, advance in public health services in 1939 was signalized by the expansion of infant welfare work, provision of examination and consultation service for school and preschool children, including dental service which theretofore had been reported as unsatisfactory, X-ray examination, and increased facilities for the control of the venereal diseases and mental conditions. Reports of the Division of Public Hygiene (Ministry of the Interior) reveal considerable prevalence of postural defects, scoliosis and flat foot in preschool children. Germany is also conducting a campaign against the excessive use of alcohol and tobacco, said to be the result of extensive and seductive advertising, and is intensifying its efforts in the prevention of drug addiction.

Advance in public health services in the Latin American Republics is represented by a number of outstanding developments which reflect the attention being given to public health by the governments and the people. New Ministries of Public Health have recently been created in Bolivia, Brazil, Colombia, Panama, Paraguay, Peru, Uruguay and Venezuela. Expansion in public health service activities are represented by wide-spread development of health centres, the extension of laboratory service, nutrition studies and greater attention to the problem of proper diet, training of public health personnel, increase in full-time health services, creation of services for public health education, improvement in vital statistics, including disease reporting and intensified efforts directed against specific diseases. Legislation providing compulsory health and social security insurance was enacted in Ecuador and Peru, and existing provision for such insurance was amplified in Chile. Increased appropriations for public health services were made by most Latin-American countries in 1939.

The health services of many countries are taking a greater interest in housing as a health problem. Great Britain has developed a progressive housing program; and of approximately £1,250,000 asked for social services in Ireland £800,000 is for housing and approximately £450,000 is for health services. (See also VENEZUELA DISEASES.)

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Public Libraries: see LIBRARIES.

Public Utilities. Legislatively, the year 1939 was much less significant than the preceding years of "New Deal" influence, the era of legislative expansion and reorganization of public utility regulation having apparently come to a close. The only significant piece of Congressional legislation was an amendment of the Tennessee Valley Authority Project Act which expanded the borrowing capacity of this public corporation in order to enable it to pay its share of the acquisition price of privately owned public utility properties in the valley region. As indicative of the tendency in public policy to call a halt in the

process of reorganizing State regulatory commissions, the failure of the long drawn out attempt to abolish the Public Service Commission of Wisconsin, replacing it with an Administrator and a species of administrative court, should be recorded. Fresh periodic attempts to set up a State commission for public utility regulation were defeated in Texas and Florida.

Administrative commissions both State and Federal, continued to turn out the annual grist of investigations, opinions and orders. The Federal Power Commission, under the Natural Gas Act of 1938, began an extensive investigation of natural gas rates in Colorado, Wyoming and New Mexico. Little progress, however, has as yet been made by the Securities and Exchange Commission in working out the physical integration program under section 11 of the Public Utility Holding Company Act of 1935. On the other hand, the commission has made notable progress in the simplification of holding company financial structures on a voluntary basis.

While the grist of actual legislation was small, important investigations and reports concerning public utility matters were initiated or concluded during the year. In April a congressional committee investigating TVA operations made a majority and minority report, giving the country directly opposite conclusions. Speaking generally, the majority upheld the present functioning of the board while the minority accepted the criticisms of the board's former chairman, A. E. Morgan, besides developing several of its own. On the question of administrative autonomy, the majority would merely eliminate control by the General Accounting Office, substituting what it regarded as more suitable audits by a private auditing firm responsible to Congress. The minority, however, recommended a complete reorganization of activities with the return (1) of agricultural functions to the Department of Agriculture, (2) of dam construction and operation and river regulation to the War Department, (3) a revamped TVA board of five directors retaining merely the marketing of wholesale power under local and Federal regulation and taxation as would be the case with private enterprise. On the very contentious yardstick issue, which the TVA exemplifies more than any other agency, the majority contended "that the electric rates of the Authority provide a legitimate, honest yardstick of equitable rates of private industry" while the minority held that the word "yardstick" should be stricken once and for all from the TVA vocabulary. The most reassuring finding that private industry can extract from the report is probably the conclusion that the TVA will not be able with its present or prospective supplies of power safely to expand beyond its present service area. (See also TENNESSEE VALLEY AUTHORITY.)

Another committee, the National Defense Power committee, with Mr. Louis Johnson, assistant secretary of War, as chairman has been at work since Sept. 1938 to investigate the total power production capacity of the United States. Because the World War (1914–18), with its increased power demand for munitions and other purposes developed a serious power shortage, this committee is required to study the problem as a phase of the general problem of national defence and to recommend steps to assure a plentiful supply. In this connection needed links in the transmission network are especially important.

Another important committee, or rather renewal of an older committee, is the National Power Policy committee. Under the chairmanship of the secretary of the Interior, Mr. Ickes, this group is also to report on existing power capacity and transmission facilities and to project the requirements into the future, studying means, both public and private, of alleviating any shortages or inadequacies. In this connection a technical report suggesting something approaching a British Grid system for the United States has been much discussed but no definite recommendations are as yet available.

Certain preliminary figures of the census report on electrical industries for 1937 have become available showing changes in number of customers, sales in kilowatt hours and revenues for the year. Judicially, more than usual interest attaches to the dismissal by the United States Supreme Court in January of certain utility suits against TVA. This decree may be said to constitute the concluding action in the long campaign on the part of private utilities to thwart the power production and power marketing program of the Federal Government as incidental to its nation-wide program of river regulation in the interests primarily of navigation and flood control.

In April the highest court reversed a statutory district court in the so-called "York Case," where that court had granted an injunction against a temporary rate reduction order of the Pennsylvania Public Utility Commission. Because the commission had not made a finding of "fair value" in accordance with former decisions of the Supreme Court but had avowedly based its decision on historical investment cost, the lower court considered the temporary rate-fixing procedure as confiscatory. The Federal Supreme Court, however, while not definitely overruling the leading case of *Smyth v. Ames* of 1898 as demanded by Justices Frankfurter and Black, found that there had been presented no compelling evidence to sustain confiscation. This decision is hailed by many as the first step in the final approval by the revamped Supreme Court of the "prudent investment" basis of public utility rate regulation.

There remains only to record the facts regarding the substantial completion of the Tennessee Valley Authority's purchasing program, designed to bring about peaceful relations between the Federal Government and the private utility industry in the Southwest. Combined with certain earlier purchases of transmission lines, substations and distribution systems of the Mississippi Power company and Alabama Power company in 1934 and 1936, the current purchases with a few minor supplementary acquisitions are designed to give the TVA and its public and co-operative distributors complete control of the market in an area comprising practically the entire State of Tennessee, the northern tiers of counties in north-eastern Mississippi, northern Alabama and north-western Georgia.

The table gives the amounts involved:

Seller	Total price	TVA payment	Contractors' payments
Tenn. Public Service Co.	\$ 8,035,000	\$ 2,551,500	\$ 5,483,500
Memphis Power & Light Co. . . .	17,300,000	2,110,000	15,250,000
Miss. Power Co.	2,000,000	1,333,000	667,000
Tenn. Elec. Power Co.	78,600,000	44,500,000	34,100,000
	\$105,995,000	\$50,494,500	\$55,500,500

In accordance with TVA policies, the above purchases give the Federal agency complete control over all power producing facilities, both steam and hydro, operating in the area together with all major interconnecting transmission facilities, enabling it to serve the local distributing utilities with which it has contracts for the supply of power at wholesale rates. The Oct. 1939 report showed that TVA was supplying all the power requirements of 63 cities, 29 co-operatives, 2 private companies, 11 temporary operating districts and Government reservations. The monthly output is resold to 354,540 customers of all classes and represents 596,446,121 kw. hours. The importance of these arrangements is that it may point the way in which the output of other Federally promoted power supplies will be absorbed as these projects go into production.

(See also ELECTRICAL INDUSTRIES; LEGISLATION, FEDERAL; SUPREME COURT OF THE UNITED STATES: *Utilities*.)

(M. G. G.)

Public Works Administration (PWA): see HOUSING.

Publishers' Prizes: see LITERARY PRIZES.

Publishing. The American book trade enjoyed a relatively prosperous year in 1939, although the number of new books and new editions decreased about 4% from the total of 1938. Inexpensive editions were published in greatly increased quantities, and one newcomer in this field successfully introduced paper-bound reprints to sell at retail for 25¢. Table I, prepared by *The Publishers' Weekly*, gives the comparable figures of book production for 1939 and 1938 in the various international classifications.

Table I.—U.S. Publications

	For 1938			For 1939			Net Change
	New Books	New Editions	Total	New Books	New Editions	Total	
Philosophy	80	15	104	91	11	102	— 2
Religion	700	31	821	660	28	697	—124
Sociology, Economics	758	80	838	773	81	854	+ 16
Law	114	34	148	138	22	160	+ 12
Education (books on)	295	18	313	293	22	315	+ 2
Philology	266	29	295	256	30	286	— 9
Science	423	102	525	422	101	523	— 2
Technical Books	310	135	454	345	116	461	+ 7
Medicine, Hygiene	293	97	390	307	124	431	+ 41
Agriculture, Gardening	115	21	136	100	29	129	— 7
Domestic Economy	73	16	89	88	16	104	+ 15
Business	299	60	359	298	59	357	— 2
Fine Arts	252	35	287	262	26	288	+ 1
Music	106	18	124	111	13	124	— 1
Games, Sports	193	20	213	190	20	210	— 3
General Literature	508	54	562	511	73	584	+ 22
Poetry, Drama	698	46	744	584	73	657	— 87
Fiction	1,217	446	1,663	1,133	414	1,547	—116
Juvenile	895	146	1,041	830	119	949	— 92
History	776	81	857	708	96	804	— 53
Geography, Travel	317	49	366	296	61	357	— 9
Biography	604	58	662	557	71	628	— 34
Miscellaneous	64	12	76	70	8	78	+ 2
Total	9,464	1,603	11,067	9,015	1,625	10,640	—427

Among the domestic events favourable to publishing in 1939 was continuation of the 1½¢ postage rate on books for two more years, until June 30, 1941.

Best Sellers.—The most popular book of 1939, fiction or non-fiction, was John Steinbeck's *The Grapes of Wrath*, which according to the percentage analysis of *The Publishers' Weekly*, had a sale of more than 300,000 copies. Rachel Field's *All This and Heaven, Too*, first published in 1938, was second among novels in 1939 with 107,780 copies printed, and Daphne du Maurier's *Rebecca*, another 1938 publication, was third with 162,300. Other works of fiction in the order of their sales in 1939 were *Wickford Point*, by John P. Marquand; *Escape*, by Ethel Vance; *Disputed Passage*, by Lloyd C. Douglas; *The Yearling*, by Marjorie Kinnan Rawlings (published in 1938); *The Tree of Liberty*, by Elizabeth Page; *The Nazarene*, by Sholem Asch; and *Kitty Foyle*, by Christopher Morley. The last two novels were published in October and therefore their sales are not strictly comparable with those of books published earlier in the year. *Escape* was published in September.

The sale of non-fiction reflected public pre-occupation with international events. First on the list of best sellers in 1939 was *Days of Our Years*, by Pierre Van Paassen (230,000 copies sold). Second was *Reaching for the Stars*, by Nora Waln, and third, *Inside Asia*, by John Gunther. Others were *Autobiography with Letters*, by William Lyon Phelps; *Country Lawyer*, by Bellamy Partridge; *Wind, Sand and Stars*, by Antoine de Saint Exupéry; *Mein Kampf*, by Adolf Hitler; *A Peculiar Treasure*, by Edna Ferber; *Not Peace But A Sword*, by Vincent Sheean; and *Listen! The Wind*, by Anne Morrow Lindbergh, published in 1938.

Great Britain.—September, ordinarily one of the busiest months for the English book trade, was one of the poorest within memory; the coming of war virtually stopped all activity in the business. But public attention was soon directed to the virtues of reading as a diversion from unpleasant realities—a "lenitive," as one observer put it. By the first part of October normal conditions were restored, and provisional estimates indicated that retail sales

in the last three months of 1939 were not far below those for the last three months of 1938. Table II, compiled by *The Publishers' Circular*, London, shows the number of new books and new editions which appeared during 1939.

Table II.—British Publications

	For 1939			New Editions, 1939	Totals, 1939	Totals, 1938
	New Books	Translations	Pamphlets			
Philosophy	172	18	5	30	225	273
Religion	623	30	67	99	819	982
Sociology	688	26	312	80	1,106	1,145
Law	130	5	61	80	276	310
Education	178	2	53	32	265	279
Military, Naval	122	3	83	46	254	216
Philology	247	3	20	25	295	292
Science	569	12	52	98	722	701
Technology	426	6	106	130	677	755
Medicine, Public Health, etc.	348	8	50	119	525	518
Agriculture, Gardening, etc.	159	1	42	37	239	215
Domestic Arts	82	..	16	13	111	97
Business	83	..	17	30	130	158
Fine Arts	250	6	44	21	321	314
Music (books on)	61	..	6	6	73	61
Games, Sports, etc.	158	3	13	45	219	263
Literature	295	8	23	50	376	400
Poetry and Drama	280	29	108	74	491	624
Fiction	1,666	58	..	2,260	3,984	4,358
Juvenile	858	22	256	429	1,565	1,629
History	490	34	34	64	622	662
Description and Travel	451	23	7	138	619	759
Geography	69	..	3	6	78	64
Biography	557	39	16	108	720	753
General Works	201	..	..	..	201	293
Totals for 1939	9,154	336	1,394	4,029	14,913	16,091
	10,884					
Totals for 1938	11,744			4,347	16,091	

Other Countries.—The number of new books and new editions published in France in 1938 was 15,894; in Italy, 10,648. The production of European works in German in that year was 25,439. Russia's production in 1936 (the last year for which statistics were issued) was about 42,000 books and pamphlets. (J. V. Do.)

Puerto Rico, a United States insular dependency in the West Indies; languages, English and Spanish; capital, San Juan; governor, Rear-Admiral William D. Leahy. The area is 3,435 square miles. The population by the 1930 census was 1,543,913, and was officially estimated at 1,805,480 in 1938. In 1930, 25.7% of the population was Negro. The chief cities (with 1935 estimated populations) are: San Juan, 137,215; Ponce, 60,867; Mayagüez, 44,907.

History and Government.—Puerto Rico is governed by a governor appointed by the President of the United States and an elected bicameral legislature.

On Sept. 11, 1939, Rear-Admiral William D. Leahy (retired) assumed the governorship, succeeding Brigadier-General Blanton Winship, governor since 1934.

The appointment of Admiral Leahy, a specialist in naval strategy, was closely connected with measures looking toward the development of Puerto Rico as a major cog in the United States Caribbean defences of the Panama canal. On July 1, a new military department of the United States, the Department of Puerto Rico, with headquarters in San Juan, was created. San Juan, according to the new policy, is to serve as one of the great strategic centres in the Atlantic, with aviation bases, modern coast defences, and anti-aircraft guns, and as a general base of supply for military and naval operations throughout the Caribbean. Estimated costs are \$30,000,000. In September, 1,700 additional troops, chiefly anti-aircraft and coast artillery units, were transferred to Puerto Rico and, in October, contracts aggregating \$8,300,000 were made for the construction of a naval air base at Grande island, near San Juan.

In keeping with the new military emphasis on Puerto Rico, the

island was important in the February war games of the United States Navy.

Throughout the year 1939 Puerto Rico continued to face economic difficulties, arising primarily from her overpopulation and from the quota restrictions placed upon sugar, her most important single product. Early in the year Governor Winship officially complained that the island had not received its fair share of relief and rehabilitation appropriations. Business groups within the island placed emphasis upon three major points as essential for restoration of Puerto Rican prosperity: increase of sugar quota, amendment of the United States Wages and Hours Act, and improvement of credit facilities. The sugar quota for 1939 was 851,000 tons, but there was actual cane in the fields ready for cutting and processing sufficient to produce 1,200,000 tons. Quota modification in September, as a result of the sugar panic in the United States temporarily alleviated the situation but did not remedy it. Early in the year Puerto Rico experienced labour troubles as a result of application of the United States Wages and Hours Act. Lower standards and costs of living, it was alleged, necessitated exemptions, and employer groups vigorously opposed the new act. In April, 20,000 sugar factory workers struck for minimum wages of 25 cents an hour. In August it was estimated that 1,000,000 persons, or 65% of the population, were undergoing hardships due to lack of work and of adequate food. The restricted sugar quota compelled closing of sugar mills in May, after the shortest grinding season in 25 years. Governor Leahy reported, shortly after assuming office, that 476,000 were unemployed, and asked aid. For the coffee industry, representing a \$26,000,000 investment in 400,000ac., with 500,000 persons dependent upon it, aid was also asked. To alleviate unemployment a \$100,000,000 Federally financed corporation, to finance agricultural, industrial, and mining enterprises, was recommended by Secretary of the Interior Harold Ickes.

During 1939 marked progress was made in betterment of health conditions, with notable decreases in the malaria and hookworm death rate.

The tourist trade brought 18,917 tourists (more than triple the 1935-36 figure) in the 1938-39 season, besides 28,616 personnel of the United States and foreign war vessels.

Education.—In 1939, Puerto Rico had 1,830 primary schools, with 281,539 enrolment (a slight increase). The University of Puerto Rico (enrolment 4,500), already important as a cultural link between the Americas, is in process of development as a major centre of inter-American cultural exchange. The Eighth Congress of the World Federation of Education Associations was held at San Juan during Aug. 1939.

Finances.—The monetary unit is the United States dollar. The budget for 1938-39 (accounting for slightly more than one-fourth of the total costs of government) amounted to \$14,223,510.14. Bonded indebtedness on June 30, 1939, was \$26,215,000 (\$27,400,000 on June 30, 1938).

Total revenues available in 1938-39 were \$44,496,702.25 (\$44,255,382.41 in 1937-38).

Trade and Communication.—Puerto Rico has regular, daily air transport communications with the United States and southward to Panama. Frequent, regular steamship sailings connect the island with other parts of the West Indies and with the United States. There are 492km. of railways and a main highway system of 1,896km., supplemented by local roads. The insular Government owns and operates 1,900km. of telegraph and 3,157km. of telephone lines (15,171 telephones).

Exports in 1938-39 totalled \$86,486,570 (\$82,077,178 in 1937-38), of which \$84,782,650 went to the United States. Imports were \$82,724,182 (\$93,314,783 in 1937-38), of which \$75,684,719 were from the United States.

Agriculture and Manufacturing.—Puerto Rico is primarily agricultural. Sugar (1,703,938,000lb. in 1938-39) accounts for 70% of the income. Coffee (23,498,000lb. in 1939-40) is largely for local consumption. Tobacco (11,688,384lb. in 1938-39) and tropical fruits, especially grapefruit and pineapple, are also important. Manufacturing is limited, but rum (supplying two-thirds of the United States demand), cigars, canned fruit and fine embroideries are important. (L. W. Be.; M. H. B.)

Pugilism: see BOXING.

Pulitzer, Ralph (1879-1939), American publisher, was the eldest son of Joseph Pulitzer, one of America's most distinguished journalists. He was born in St. Louis, Mo., on June 11 and was educated during his youth by private tutors. After four years of travel abroad he entered Harvard, where he graduated in 1900. Immediately thereafter he began his journalistic career on *The New York World*, the famous liberal daily founded by his father. When Joseph Pulitzer died in 1911, Ralph Pulitzer became president of the Press Publishing company, which published both the *World* and the *Evening World*. His younger brother Joseph Jr., inherited the other crusading Pulitzer paper, *The St. Louis Post-Dispatch*. Ralph Pulitzer remained as publisher of the *World* until it was sold in 1930. In 1934 he was administrator of the newspaper code under the NRA. He died in New York city on June 14.

Pulitzer Prizes: see LITERARY PRIZES: *United States*; THEATRE.

Pulp Industry: see PAPER AND PULP INDUSTRY.

Pumice. A silicate of aluminium, of volcanic origin, pumice occurs as lumps or gravel, and also as volcanic dust, known as pumicite. Pumice is produced in the United States in California and New Mexico, and pumicite in Kansas, Nebraska, California, Oklahoma, and Oregon with a total output of 65,742 short tons in 1938. About 71% of the output is used in cleaning and scouring compounds and hand soaps, 12% in the production of light-weight concrete, and 5% for acoustic plaster. Pumice is also produced extensively in Italy (about 100,000 metric tons annually), and in Greece, imports from both of these sources being used in the United States. (G. A. Ro.)

Purdue University, at Lafayette, Ind., is Indiana's Land Grant institution, created under the Morrill Act of Congress of 1862, granting to each State public lands for the establishment of a university for the teaching of "agriculture, science, and the mechanic arts." Enrolment as of Oct. 1, 1938, was 6,778, divided as follows: all engineering, 3,611; agriculture, 829; pharmacy, 162; science, 791; home economics, 791; physical education, 132; graduate students, 421. This is a gain of practically 10% over the previous year. For some years Purdue has had the largest engineering enrolment of any institution of higher learning in America. The faculty and staff numbers over 900.

Research work of the university is being constantly expanded in the fields of agriculture, engineering, science and pharmacy. New studies of importance in nuclear physics have been started with the cyclotron or "atom smasher"; commercial exploitation of the fundamental research of the nitration and chlorination of hydrocarbons has proven unusually productive during the year; basic research has been undertaken co-operatively with both private corporations and governmental agencies in aeronautics, radio, and television; 50 of the 330 college and university students who were trained in the spring of 1939 in institutions of higher learn-

ing were trained and licensed at Purdue on the university airport of 208ac.; 50 more were trained in the autumn of 1939.

During 1939, four more units were added to the men's residence hall group, providing living quarters for 1,060 men; a third unit was added to the women's residence halls, bringing their capacity to 400. The new building for the School of Chemical and Metallurgical Engineering was occupied in the autumn of 1939 and the new music hall and auditorium with a seating capacity of 6,207, is scheduled to be dedicated toward the end of the 1939-40 academic year. The additions to the Memorial Union building, almost doubling the capacity of that structure, were occupied in Jan., 1940. Buildings on the campus and adjoining farms now number 72.

PWA: see HOUSING.

Pyrite or Pyrites. World production of pyrite in 1936 reached 8,700,000 metric tons, slightly more than the 1929 high, after having dropped to a low of 5,700,000 metric tons in 1932. Spain was the leading producer, having furnished 51% of the output in 1929, 37% in 1932, and 27% in 1935. In 1936 operation of the largest Spanish mines was seriously interrupted by the civil war when the region was occupied by the rebel forces. Among other producers, Japan has a rapidly increasing output that ranked second in 1934 and 1935, and has possibly stood in first place since then. In the next rank of producers with outputs of 500,000-1,000,000 tons, are Norway, Italy, the Soviet Union and the United States; in the 100,000-500,000 ton group are Cyprus, Germany, Portugal, France, Greece, Canada, and Sweden, and a number of others have still smaller outputs. With no data available from Spain, Japan, and the Soviet Union since 1935, no estimate can be given on current world output.

The United States output of 564,500 metric tons in 1938, a 5% decrease from 1937, was insufficient to meet the demand, and was supplemented by imports of 340,000 tons, almost entirely from Spain. Partial data for 1939 indicate a rise of about one-quarter in imports.

British production of pyrite is insignificant (4,700 long tons in 1937); Australia, Southern Rhodesia and South Africa have outputs of 20,000-30,000 tons; there is no direct production in Canada, but by-product concentrates were recovered from copper ores and sulphur and sulphuric acid were produced from smelter gases, containing a total of 112,400 short tons of sulphur content in 1938, equivalent to about 225,000 tons of pyrite. (G. A. Ro.)

Quebec, one of the original Provinces of the Dominion of Canada; area, 594,534 sq.mi.; population, according to the Dominion census of 1931, 2,874,255, estimated Jan. 1, 1940, 3,172,000. Capital, Quebec, 130,954. The only city with larger population is Montreal, 818,577. Of the Province's population 1,813,606 are urban, or 63%; 2,696,122 native born; only 178,133 foreign born.

Two types of trade unions are found in Quebec; the National Catholic Unions and the older International Unions. The former have a membership of about 57,000, while the membership of the latter is 59,000. The net value of production in the province for 1936 was \$656,952,315, an increase of 8% over the preceding year. The gross value of agricultural products in 1936 was \$111,742,408, of manufactures \$377,514,998, a decrease of 4% from the preceding year.

The Union Nationale Administration of the Hon. Maurice Duplessis was defeated in Oct. 1939 and the Liberals were returned to power with the Hon. A. Godbout as premier and attorney-general. The standing of the different parties at the present time

(1940) is as follows: Liberal, 68; Union Nationale, 16; Independent, 1, and National 1. The Hon. E. L. Patenaude is the lieutenant-governor. Quebec is represented in the Dominion Parliament by 24 Senators who are appointed for life and by 65 members of the House of Commons who are elected for five years or less.

BIBLIOGRAPHY.—*Statistical Year Book; Annual Report of the Provincial Secretary and Treasurer.* (J. C. HE.)

Queensland (Australia).—Area 670,500 sq.mi.; pop. (est. Dec. 31, 1938) 1,004,150. Chief towns (pop. Dec. 31, 1938): Brisbane (325,890); Rockhampton (32,526); Townsville (31,414). Governor: Sir Leslie Orme Wilson, G.C.S.I., G.C.M.G., G.C.I.E., D.S.O.

History.—On August 18 Mr. Forgan Smith's tenure of office as premier became the longest in the history of the State, surpassing the record of the late Sir Samuel Griffith. Mr. Forgan Smith has been in continuous office since 1932. Mr. Hynes, minister for labour and industry, died during 1939 and was succeeded by T. A. Foley, while J. Larcombe became minister for mines.

The budget revealed a surplus of £14,046 for the financial year 1938-39, revenue being £19,330,369 and expenditure £19,316,323. A deficit of £64,702 was estimated for 1939-40 but no extra taxation was imposed.

The Motor Spirit Vendor's Act, to encourage the production of power alcohol, compelled gasoline vendors to purchase two gallons of power alcohol for every 100 gal. of motor spirit sold.

The governor's speech at the opening of parliament on August 8 reviewed the steady growth in the prosperity of the State during recent years. Total production during the year 1938-39 was valued at £68,136,000, and was the greatest ever recorded. Primary production and factory production showed increases of 22.8% and 11% respectively over the past 10 years, and unemployment a decrease from 22.2% in 1932 to 4.2% in 1939.

Rate of population growth was greater than in any other State, and the national income had increased by 11.3% since 1929.

Overseas exports direct from Queensland ports constituted a record.

In July the Premier opened the new outer harbour at Mackay, which had taken five years to build and had cost £1,000,000.

(L. R. Mc.)

Education.—In 1936: schools 1,956, scholars 201,514.

Banking and Finance.—Revenue (1938-39) £A19,330,369; (est. 1939-40) £A20,310,735; expenditure (1938-39) £A19,316,323; (est. 1939-40) £A20,347,437; debt outstanding (June 30, 1939) £A127,503,241.

Communications.—In 1938: roads, motor 37,955 mi.; railways 6,567 miles. Motor vehicles licensed (June 30, 1938): 72,407 cars and taxis; 38,555 commercial; 7,846 cycles. Wireless receiving set licences 117,487. Telephones 58,626.

Agriculture, Manufactures, Mineral Production.—Production in 1937-38: sugar, cane 763,242 tons; wheat 3,749,000 bu.; maize 2,628,000 bu.; wool 174,751,000 lb.; gold (1938) 151,432 fine oz.; silver (1938) 3,533,490 oz.; coal 1,113,426 tons. Industry, manufacturing, 1937-38: factories 2,995; employees (average) 51,391; production, net value £17,933,752.

Quicksilver: see MERCURY.

Rabies: see VETERINARY MEDICINE.

Racing and Races: see AIR RACES; AUTOMOBILE RACING; HORSE RACING; TRACK AND FIELD SPORTS.

Rackham, Arthur (1867-1939), British artist whose illustrations for children's books were known throughout the English-speaking world, was born September 19; for his biography and list of his earlier works, see *Encyclopædia*

Britannica, vol. 18, p. 873. Among the works illustrated by him in his later years were *The Vicar of Wakefield* (1929), *The Night Before Christmas* (1931), *The Compleat Angler* (1931), *Ander- sen's Fairy Tales* (1932), *The King of the Golden River* (1932), *The Pied Piper of Hamelin* (1934), and *Peer Gynt* (1936). He also published *The Arthur Rackham Fairy Book* (1933). He died at Limpsfield, Surrey, England, on September 6.

Radio, Industrial Aspects of. Despite the sharp increase in broadcast revenue during 1939—marking still another year in which the youthful medium of radio set a dollar-volume record—the industry, as a whole, made more history in fields indicative of coming maturity than in fields (such as revenue records) which are primarily the playground of youth. In this respect, three trends are worthy of emphasis: (1) the trend toward bigger investments, not only in technical equipment, but also in personnel, wages, publicity, general operations, and in experimentation; (2) the rapid upsurge in unionism; and (3) the desire to maintain continued friendly relations with the listening public by means of self-imposed policies governing programs and advertising.

Revenue and Finance.—*Revenue, 1939.*—Not until the summer of 1940 will the official broadcast revenue figures for 1939 (receipts from advertising and allied sources) be released by the Federal Communications Commission. However, fairly accurate estimates can be made in the interim on the basis of certain trade indices whose mechanics need not be discussed here. Such indices show that net broadcast revenue—that is, revenue after all trade discounts—rose about 12% over 1938. Meantime gross revenue—that is, revenue prior to discounts—over-reached 1938 by around 13%.¹ The major networks had an especially good year, their gross receipts soaring 15.6%. This situation may be summarized as follows:

	1939	1938
Network gross receipts from sale of time	\$ 83,000,000*	\$ 71,728,400
Total industry net receipts from sale of time	131,500,000(?)	117,379,459
Total industry gross receipts from sale of time . . .	165,000,000(?)	143,500,000

*The networks' best commercial customers were tobacco manufacturers, drug manufacturers, food producers, and the makers of soaps. The automotive industry, once a leading buyer of radio time, did not spend nearly as much during 1939 as in prior years.

At this writing, however, it does not seem probable that profits rose as rapidly as income. Between 1937 and 1938, for instance, the expenses of the industry increased \$1,000,000 while advertising income was showing only dubious gains. Subsequently, wage costs and outlays on technical experimentation have been greatly accelerated, indicating that profits probably are not keeping pace with revenue.

Distribution of Profit.—If past Federal Communications Commission analyses anent the distribution of profits will hold true for 1939, then anywhere from 64% to 71% of the 700 U.S. commercial stations will show a profit, while between 29% and 36% will have expenses in excess of revenue. The generic difference between profitable and losing stations is that the latter usually lack network affiliation, operate on limited time, are situated so that economic support is difficult to obtain, or have problems of delivering a proper signal.

Singly, or in combination, these factors conspire to make a station lose money. On the other hand, aggregate losses by this group have never been alarming. In 1938 (official figures for which were released in the summer of 1939), such deficits amounted to only \$2,223,195, while the 419 stations in the profit category showed an excess of revenue over expenses of \$16,728,533 prior to

¹Magazines, newspapers, and other media compute their annual dollar volume as "gross." The FCC computes radio income as "net." Hence, the broadcast industry is in the habit of using two income figures—one for comparative purposes with other media and one for FCC purposes.

Federal taxes. If network profits are added, the aggregate industry profit for 1938 totalled \$18,854,784 prior to Federal taxes.¹

Radio v. Other Media.—There was continued evidence in 1939 that radio's acceptability as an advertising medium was still growing. Compared to the 12% rise in broadcast revenue, the performances of newspapers and magazines in the advertising field were far less spectacular. Broadcast revenue also compared favourably with indices on general business activity. Projections by J. A. Livingston, *Business Week* economist, on the "Business Week Index of Business Activity" indicate a 24% average gain in 1939 over 1938. However, since this index is largely based on industrial production—not on sales—radio's 12% increase may be assumed to be comparatively good.

Programming.—Programs, or entertainment and information, are broadcasting's primary reason for existence and the *sine qua non* of economic support from advertisers. During 1939 the programming structure was perceptibly altered. From the network viewpoint, changes in the content of evening hours centred chiefly around a deflation of formality, accompanied by an increase in such program types as drama, tests-contests (quiz programs, etc.) and news. On network daytime schedules, an ironclad domination was again exercised by the "strip serial"—a form of "heart throb" dramatic presentation akin to the cartoon strips in newspapers.

Network Evening Programs.—Statistically viewed,² the 1939-40 season which began in September compares as follows with the 1938-39 season which concluded in May (commercial programs only are tabulated here because they are in the great majority):

Type of program	1939-40 Pct. of Total	1938-39 Pct. of Total
1. Variety	35.52%	40.76%
2. Drama	18.40%	17.36%
3. Tests and Contests	16.45%	11.92%
4. Straight Popular Music	8.17%	9.98%
5. News	5.55%	4.02%
6. Comedy Teams (Amos 'n' Andy, etc.)	3.42%	2.98%
7. Classical Music	3.34%	2.04%
8. Semi-Classical Music	2.62%	2.99%
9. Familiar Music (ballads, waltzes, etc.)	2.55%	2.55%
10. Religious Programs	1.02%	0.93%
11. Talks-gossip (Walter Winchell, etc.)	1.35%	2.27%
12. Sports	0.71%	2.14%
13. Single Act (one-person variety entertainment) . . . . .	.....	0.06%

It should be noted that the proportion of dramatic programs is noticeably growing. In fact, this growth is even larger than the mere percentages would indicate, for the only partially completed 1939-40 season is being compared to the cumulative 1938-39 season. The same may be said of news programs and tests-contests.

Network Daytime Programs.—The commercial programs in the daytime category are so uniformly of the dramatic serial type that some concern has been expressed in the industry lest this lopsided schedule alienate listeners. But audience surveys continue to show that the housewife prefers problem-type melodrama to any other kind of presentation. It may safely be concluded, therefore, that the domination of the serial will continue into 1940. Daytime commercial network programs for 1939-40 compare as follows with the prior season:

Type of program	1939-40 Pct. of Total	1938-39 Pct. of Total
1. Serials and Drama	84.92%	76.46%
2. Talks and Instruction	4.54%	10.40%
3. News	3.49%	2.44%
4. Variety	2.33%	4.87%
5. Straight Popular Music	1.50%	0.93%
6. Single Act	1.16%	0.01%
7. Religious Programs	0.82%	1.21%
8. Hymn Music	0.62%	2.18%
9. Classical Music	0.18%	0.31%
10. Tests-Contests	0.18%	0.63%
11. Familiar Music	0.17%	0.05%
12. Novelty	0.09%	0.12%
13. Band Music . . . . .	.....	0.39%

¹The depreciated value of broadcast assets for the industry was \$46,777,987 of which \$11,526,179 was credited to goodwill.

²These tables were especially compiled for the 1940 *Britannica Book of the Year* by the *Variety Radio Directory*. Programs were measured by the amount of time per broadcast per week, multiplied by the number of stations on the network hookup. This method is technically known as the "station hour" method of computation.

Aside from the serials, news programs were the only class which made any appreciable gain whatsoever during the incipient 1939-40 season.

Most Popular Network Programs.—As in the past, the most popular network programs continued to be sponsored programs. Despite frequent demands that the network give more free time to programs of a purely educational, informative, or instructive sort, such non-commercial fare never commands more than a very small audience. In the following tabulation the most popular programs as of Nov. 1939, are compared with the most popular programs of the year before. The ranking is in exact order of popularity, and was compiled by the Co-operative Analysis of Broadcasting, the industry's major fact-finding body in the field of program preferences: -

Nov. 1939	Nov. 1938
1. Chase & Sanborn Program (Edgar Bergen, Dorothy Lamour, etc.)	1. Chase & Sanborn Program.
2. Jack Benny.	2. Jack Benny.
3. Lux Radio Theatre.	3. Lux Radio Theatre.
4. Kraft Music Hall (Bing Crosby).	4. Kraft Music Hall.
5. Fibber McGee & Co.	5. Rudy Vallee.
6. Major Bowes.	6. Town Hall Tonight
7. Pepsodent Program (Bob Hope).	7. Al Jolson.
8. Kate Smith Hour.	8. Big Town (Edw. G. Robinson).
9. Fitch Bandwagon (guest orchestras).	9. Major Bowes.
10. Kay Kyser.	10. Burns & Allen.
11. Good News (Edward Arnold, Fannie Brice, etc.).	11. Eddie Cantor.
12. One Man's Family.	12. Good News.
13. Town Hall Tonight (Fred Allen).	13. One Man's Family.
14. Burns & Allen.	14. Hollywood Hotel.
15. Pot of Gold (Horace Heidt).	15. Kate Smith Hour.

This individual program comparison again repeats the story told in previous statistics—contests and quizzes are much in favour; and informality is gaining the upper hand over 1938's elaborately stylized productions. One other factor should be emphasized—programs 30 minutes in length are enjoying more favour comparatively than programs 60 minutes in length. This presages a trend toward shorter programs in 1940, accompanied by still less formality, and possibly a reshuffling in the ranks of the "name stars." It undoubtedly also presages a partial trend away from the extremely high production expenses of 1938's "glamour hours."

The fact that no news program or commentator shows up in the first 15 rankings should in no way result in an underestimation of this type of presentation. Spurred by Europe's martial events, plus the coming U.S. presidential election, news has again marched rapidly to the fore. Indicative of how this trend toward news and factual information may be coupled with informality and the public's desire to participate in a test, or quiz, is the "Information, Please" series. The continued favourable reaction from press and public has made this a unique and noteworthy program, as well as the pattern for many similar productions.

Individual Station Programming.—Less spectacular than network programming, the efforts of individual stations during 1939 were none the less based on sound values. Music, news and sports received primary emphasis. Music especially showed a rise, for music is the best contrast to the many network dramatic programs. Commentators on cooking, home economics, etc. also continued to fare well.

Educational Programs.—Time given over to universities, colleges, non-profit organizations, etc. was much more deftly employed in 1939 than ever before. Not only are non-profit organizations learning the mechanics of the new medium after a period of trial-and-error production, but they are being assisted professionally by educational directors now on the payrolls of stations and networks. On-the-scenes broadcasts of foreign news and events

similarly showed much improvement in 1939. (For a more thorough discussion of this type of programming see BROADCASTING.)

Literary-Musical Property.—*Literary Property.*—During the course of 1939, the radio stations of the U.S. were on the air an aggregate of 3,500,000 hours. This vast stretch of time naturally occasioned the use of much literary property (plays, stories, etc.) to provide listeners with a proper dramatic diet. Until the 1938-39 radio season (roughly from Sept. 1938 to May 1939) radio acquired its literary property chiefly by adaptation. That is, the works of such well-known literary giants as Shakespeare, O. Henry, Ibsen, etc. were shortened and remoulded for purely aural reception.

During the 1938-39 season, however, a most significant change took place. Prompted by the increase in dramatic programs and the competitive necessity of avoiding repetition, network program producers began to decrease the number of adaptations and increase the number of specially written radio works. This may be seen from the following statistics: during the 1938-39 season 165 plays and 60 books, poems, and short stories were adapted for network use; but during this same interval no less than 207 specially written dramatic features were broadcast. Ranging from tragedy to fables in verse, this new form of dramatic writing not infrequently displayed genuine merit, and focused increasing public attention on such authors as Arch Oboler, Norman Corwin, Merritt P. Allen, Milton Geiger and True Boardman, to cite but a few. It seems safe to say that as radio "finds" itself as a medium for dramatic literature, efforts in the direction of special dramatic writing for broadcast purposes will increase in quality and frequency. Fortunately, advances in such mechanical aids as sound-effects and acoustical devices, coupled with a rising scale of pay, are enhancing the opportunities for the new literary endeavours.

Musical Property.—No other form of radio entertainment even remotely approached in quantity the amount of popular music broadcast during 1939. In the course of 12 months, an estimated 1,000,000 hours, or nearly one-third of all time on the air, were devoted to this mammoth parade of "sweet," "swing," and "ballad." Since the radio industry does not create this music, it has to license, or rent, the performing rights from various "societies" and individuals—that is, groups of composers, authors, and publishers who have united into business organizations to license the rights to their pooled musical compositions. Of these societies, the American Society of Composers, Authors and Publishers (ASCAP) engages in the heaviest traffic with the radio industry. For the use of ASCAP's repertoire, stations annually pay ASCAP 5% of their receipts, a sum which in 1938 (last year for which figures are available) came to \$3,845,206.34.

Following the sporadic, but significant, demand for anti-ASCAP legislation on the part of individual broadcasters, the industry trade association (National Association of Broadcasters) in Sept. 1939 unanimously approved a plan for establishment of an industry-controlled music venture. Designed to outmanoeuvre ASCAP, as well as release the industry from the latter's power, the new firm is called Broadcast Music, Inc. It is to be supported by an initial \$1,500,000 raised via the sale of stock and licences. Definitely placing the broadcast industry in the domain of music publishing and creation, Broadcast Music is, at this writing, in the process of formation. Whether the project will succeed, cannot as yet be foretold. But in any event, the broadcasters are determined, and the battle with ASCAP will be bitter. It will come to a head in Dec. 1940 when current ASCAP contracts are due for renewal. Should renewals satisfactory to both parties fail, a break with widespread repercussions will occur.

Phonograph Records.—Ordinary phonograph records have always been a convenient and economical means of programming

for many stations. In July 1939, this economy was threatened when a court decision held that the manufacturer of records can restrict their use to home phonographs only. Subsequently, record manufacturers have planned to prohibit use of their wares on radio stations unless a licence, scaled in the case of one manufacturer from \$1,200 to \$3,600 per annum, is first obtained. To date, new legal entanglements have held the situation in abeyance. However, should licences be issued in 1940, the cost to the industry will be quite appreciable, for about 11½% of all time on the air is occupied with the playing of phonograph records. For technical-experimental developments, television, facsimile, and frequency modulation, see RADIO, SCIENTIFIC DEVELOPMENTS OF; TELEVISION.

Short-Wave Programs.—Not a technical development, but certainly an economic experiment in 1939 was NBC's selling of time for international short-wave programs to Latin and South America. United Fruit was the first sponsor, buying a news broadcast in Spanish. Prices for this type of broadcasting were set at \$25,000 for seven quarter-hours per week per year. However, sponsorship may be carried on only under the stringent rules devised by the FCC to regulate advertising.

Employment-Unionism.—*Employment.*—The radio industry can boast that it pays higher wages than any other U.S. industry. FCC statistics for 1939 credited the industry with the following:

Full Time Employees	18,359
Average Weekly Pay	\$45.20
Part Time Employees	4,377
Average Weekly Pay	\$23.55

As against the year before, payroll figures showed a rise in weekly compensation of \$0.08 for full time employees, and \$4.58 for part time employees. The sharp increase in part time compensation may be assumed to be due to unionization. However, the complete story is by no means told in the above-cited data. To these sums must be added the many millions of dollars expended for the services of such artists as Jack Benny, Burns and Allen, etc., who are employed, not by stations or networks, but by the sponsors whose wares they help advertise.

Unionization.—At no time in radio's history has there been such a sudden and widespread mushrooming of unions as in 1939. The year's foremost victory was won by the American Federation of Radio Artists, an arm of the American Federation of Labor. On February 12 this union was awarded a code of minimum terms and working conditions governing all actors, singers and announcers commercially performing on the major networks. The new code makes a "federation shop" mandatory—that is, a union shop continually open to new membership. Minimum pay scales for actors and announcers were set at \$15 per quarter-hour, while singers were awarded a minimum of \$40. Performers working on non-commercial (sustaining) network programs already had a contract prior to the commercial victory.

Meantime, it became evident in November that the industry would have to engage in another major union encounter in 1940 when contracts with the American Federation of Musicians are due for renewal.

Present contracts guarantee the A.F. of M. a minimum of \$3,000,000 annually from stations affiliated with major networks, plus special payments by the networks on their key stations in New York, Chicago and Hollywood. As the situation currently stands, the union wishes to increase station payments by 50% and network special payments by 100%.

Other 1939 union activity paled beside the above mentioned events, but a thorough—if local—job was being done by the technicians' unions throughout the year in organizing engineers and technical operators. In fairness to both sides, however, it may be said that all activity and counter-activity caused no public

inconveniences whatsoever. Actual strikes and interruptions of broadcast schedules were so rare as to be negligible.

Radio v. Public.—Fully aware that standardized rules governing programming and business procedures are more acceptable to the public than haphazard regulation, the National Association of Broadcasters in July 1939, adopted a formal code of conduct. It specifies:

Children's programs . . . must not contain sequences involving horror or torture or use of the supernatural or superstitious or any other material which might reasonably be regarded as likely to overstimulate the child listener, or be prejudicial to sound character development. No advertising appeal which would encourage activities of a dangerous social nature will be permitted. . . .

Time for the presentation of controversial issues shall not be sold, except for political broadcasts. . . .

Broadcasters . . . will continue their search for improving applications of radio as an educational adjunct. . . .

News shall be presented in fairness and accuracy and the broadcasting station or network shall satisfy itself that arrangements made for obtaining news insure this result. . . .

Radio . . . may not be used to convey attacks upon another's race or religion. . . .

The code further specified limitations on the amount of time which may be devoted to advertising on radio programs, and listed certain types of products and advertising appeals which are henceforth unacceptable. While the code to date has not put any barriers in the way of the Father Coughlin broadcasts (mainly because of prior contractual obligations on the part of stations), it is generally viewed as a healthy and far-sighted development in the industry. Meantime, the National Broadcasting Co. issued a code of its own, clearly stating public obligations to be observed in network broadcasting, and the three major networks—NBC, CBS and Mutual—in September formulated a set of self-imposed rules governing fair and accurate news coverage of the European war. (See BROADCASTING.)

Research.—Industry research in 1939, as in the previous several years, again centred mainly around the problem of determining how large an audience is commanded by each of the various programs. The ramifications of this matter are too lengthy and technical to be discussed here. Suffice it to say that the following methods of determining program popularity were either actively employed or tested in 1939: (a) telephone surveys involving a review of the listener's radio activity over the past several hours; (b) coincidental telephone surveys—that is, asking the interviewee to what program he is *now* listening; (c) personal interviews; (d) measurement of listening by means of automatic recording devices attached to receiving sets.

Most important also was a survey completed by the Joint Committee on Radio Research on the subject of rural radio. Its highlights were: 69% of all rural families (or 9,470,900) owned at least one radio set as of Jan. 1, 1938; 5.8% rural homes have multiple sets; the median daily use of rural radio sets is four hours, 47 minutes.

As to the 1939 total number of sets in the U.S., the publication *Radio Today* estimated 45,200,000 (including auto, portable and multiple sets) owned by 28,700,000 families.

Government v. Industry.—Broadcasting in all its phases is regulated by the Federal Communications Commission, a seven-man board appointed to administer the Radio Act of 1934. Any discussion of this administration is best approached from a legal angle, and will not be attempted here. But some reference to the general situation may be profitable.

Changes in FCC Personnel.—Two new members were added to the FCC in 1939: James Lawrence Fly, previously general counsel of the Tennessee Valley Authority, who became FCC chairman in September, succeeding Frank R. McNinch, resigned; and Frederick Ingate Thompson, newspaper publisher, who took the place of Eugene O. Sykes, also resigned. Mr. Fly's appointment as chairman was generally hailed in the broadcasting industry as

presaging improved relations between members of the FCC, and between the FCC and the industry as a whole.

FCC Rules and Regulations.—As the result of extensive hearings dating back to 1937, the FCC issued in 1939 a new set of regulations governing standard broadcast stations. The most noteworthy of these regulations were: (1) refusal to allot wattage as high as 500,000 because of "speculative risks, unsupported by adequate data, even though it be true from a technical standpoint that 500kw. power is one of the methods to improve service in rural areas"; (2) station power increases where needed and feasible; and (3) the safeguarding of rural and small-town coverage through preservation of 26 clear channels free of any nighttime duplication, and 18 additional channels in such shape as to be relatively free from interference in outlying areas.

While the commission throughout the year found itself in the dilemma of whether to adopt socio-economic viewpoints in the regulation of the industry, or whether to confine itself to technical factors alone, there was some relaxation in the tendency to wander too far afield in socio-economic directions. Fewer inquiries into the minutest financial and programming affairs of stations were promised for the future.

Agitation for changes in the commission came to naught on the part of Congress. Less and less fear was expressed over newspaper ownership of stations (publishers own one-third of all U.S. stations either wholly or in part). And censorship—that is, stringent regulation of programs—dwindled after the incipient tendency was loudly decried. Meantime the FCC carried on exhaustive hearings as to the operation and management of the major networks. The results of this investigation have, to date, not been made known.

As a subsidiary development in radio's relations with the Government, it might also be noted that in 1939 representatives from radio were for the first time admitted to Congress and the White House on the same footing as representatives from the press.

Radio in the Western Hemisphere.—The radio stations of North, Central and South America have one common characteristic which distinguishes them from the radio stations of the Old World: they are principally operated on the economic foundation of advertising. Estimates for 1939 indicate that there are 510 stations in the 20 Central and South American nations,¹ and an aggregate set ownership of roughly 2,500,000. Canada meantime has 85 stations, and a total set ownership of 2,000,500.

These figures, when compared to statistics for the United States, show that the latter has over one-sixth again as many stations as the rest of the western hemisphere combined, and ten times as many radio sets, although the population of the U.S. is no greater than that of all the neighbour nations. This mighty preponderance of the U.S. in broadcast facilities and set ownership may be ascribed, at least in part, to the coverage problems of the other nations. Faced with large, and sometimes oddly-shaped, land areas, these nations had to contend with the dilemma of serving scattered population without incurring financial disaster. Furthermore, national boundaries, the barriers of language and the widely-spaced concentrations of humans and human wealth have created bizarre marketing conditions to begin with, and these reflect on the amount and feasibility of radio advertising.

It is not unique, therefore, that the broadcast operations of the U.S.'s neighbours are on a smaller scale than those of the U.S. Except for Canada, networks play no integral role in the radio picture, being hindered by geographical-political confines and the economic hardships of long "line hauls." Programming likewise is far less elaborate. Music, news, a certain amount of drama, and perhaps some scattered tests-contests, form the principal en-

¹Excluding some short-wave stations used for national purposes.

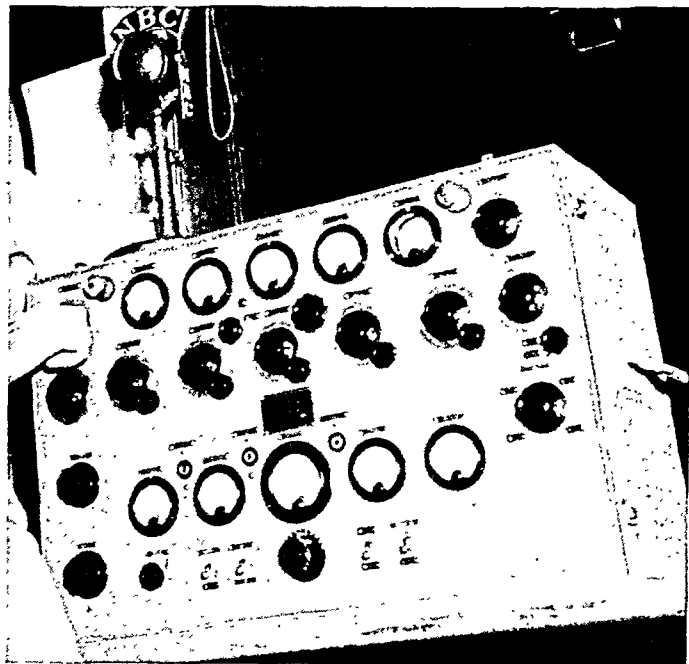
tertainment values. But while the factors of geography and history indicate that the U.S.'s radio leadership will not be challenged for many years to come, it is safe to say that radio's importance in the national life of the western hemisphere will grow rapidly and soundly.

Canadian Radio.—Under 1939 plans, the CBC will control all high-power wattage in Canada. Private broadcasters are envisioned in the role of providing "local coverage," and increases in private wattage, if any, will be sparing. A tendency toward network rate-regulation of private stations is afoot. Private stations, once allowed to form their own networks, no longer may do so without the approval of the Canadian Broadcasting Co.

Canadian Radio vs. the War.—Due to European hostilities, the CBC made certain regulations governing the broadcast industry's conduct during the war. These regulations specified: (1) obedience to a censorship board which, however, intended to interfere as little as possible with the "ordinary avocations of life and the enjoyment of property;" (2) guarding of CBC property by the R.C.M.P. to prevent sabotage; (3) submission of advance information on talks and speakers; (4) prohibition of all foreign language broadcasts; (5) discontinuance of weather reports east of Toronto; (6) discontinuance of broadcasting from public meetings; (7) submission of news copy to the censorship board. CBC employees, except in specific instances, were exempt from military service.

North American Regional Broadcast Agreement.—In 1937 the four principal nations of North America—the United States, Canada, Cuba and Mexico—negotiated an agreement to facilitate better apportionment of wave-lengths, power and interference-free reception. Cuba, Canada and the United States ratified the agreement not long afterward, but Mexico during most of 1939 continued to be a stumbling block, again delaying the signing of the negotiation. It was rumoured that the difficulties resulting from Mexico's failure to ratify were brought about at the insistence of certain high-powered border stations (some of which are financed by U.S. capital and located in Mexico to evade U.S. regulations). In early December the situation, already bad, grew worse when a second rumour spread that the Mexican border stations would actually "jump" on frequencies already held by important U.S. stations. However, on almost the very last day of the year—on December 29—the Mexican Senate suddenly committed an amazing about-face and ratified the agreement, effective in 90 days. At present it is too early to see whether, and to what extent, the ratification is complicated with reservations or qualifications. But the prospects do seem bright for better wave-length order between the "neighbour nations" in the future, and Mexico's sudden ratification undoubtedly was brought about by a realization on the part of the majority of Mexican broadcasters that disorder works many an economic hardship. (E. A. Gd.)

Radio, Scientific Developments of. Radio has become so wide-flung an activity, both geographically and in its technical scope, that a brief annual review of scientific progress must necessarily be limited to features of outstanding importance and interest. The radio services of relatively long standing, such as those which carry speech or telegraphic messages across the continents and oceans and those which broadcast music and information to the publics of many lands, have continued to prove their worth but have adopted few modifications in technique. The major scientific developments have, perhaps naturally, been a part of the newer services such as ultra-high-frequency broadcasting, television and facsimile transmission. However, more recent applications of methods of observation and measurement, including particularly the use of that powerful research tool provided by the



A PORTABLE RADIO TRANSMITTER weighing less than 100lb. was built in 1939 for transoceanic broadcasts

cathode ray tube as an oscillograph, have added to the store of knowledge as to fundamentals and as to performance in all branches, old and new, of the radio field.

Before passing to a consideration of the scientific developments in the still less extensively applied portions of radio, it should be noted that in ordinary broadcasting there has been achieved considerable progress in improving the realism or naturalness of tone reproduction. For some years it has been recognized that speech and music, as provided in the home by a broadcast receiver, did not sound fully natural. That it did not represent a true replica of the sounds originating in the studios was attributed largely to the fact that the system as a whole (microphone, transmitter, receiver and loudspeaker) was not designed to carry effectively the entire range of audible sound frequencies from, say, 16 to 16,000 vibrations per second. To improve the situation, individual transmitters and receivers had been made to extend the usual range of perhaps 80–5,000 vibrations to as high as 10,000, but strangely enough (as it seemed) the wider range systems were less acceptable than the older ones, because the tones showed an unpleasant sibilant roughness. In the year 1939 this apparently anomalous result came to be generally understood, and the fault recognized to lie not in the extension of the tone-frequency range but in the failure of the earlier experimenters to detect and minimize non-linearity or harmonic distortion in their apparatus. Consequently some of the newer tools for reducing such distortion, such as the so-called inverse feed-back systems, are coming into wider use, and the tone-frequency range of broadcasting is being usefully extended and the fidelity of reproduction thus improved.

Radio facsimile, in which a picture or text passed through the transmitter is automatically copied or reproduced on paper at one or many distant radio-operated recorders, has benefited from substantial scientific improvements during 1939. The most successful facsimile recorders utilize either a carbon paper for mechanical impression of the symbols or a specially treated paper which changes colour when acted upon thermally or electrolytically. Improvements in the recording papers and in the recorders themselves have made possible the transmission of type or drawings at speeds in excess of 16 sq.in. per minute, with sufficiently exact reproduction to show 8-point type clearly and legibly. Under such conditions, text may be transmitted by radio at speeds in excess

of 300 words per minute, something like five times the word-speed of the page-printing telegraph.

One of the problems of facsimile transmission between widely separated points has been, in common with photo-radio, the automatic synchronization or locking together of the transmitting device and the reproducing recorder. The year 1939 has seen the completion of substantial improvements whereby it is no longer necessary to utilize such cumbersome and expensive systems as those having electrically-controlled tuning forks to permit synchronous operation.

In ultra-high-frequency radio transmission, both for broadcasting and for point-to-point service, progress has been made in the provision of vacuum tubes for higher powers at the upper frequencies. Likewise, ultra-high-frequency receivers have been greatly improved as to sensitiveness, simplicity of operation and stability. The most striking event of 1939, however, was the rapid development of the system of frequency modulation, as contrasted against the slow growth of the older system of amplitude modulation, both in the ultra-high-frequency portions of the radio spectrum. In frequency-modulation, the transmitter radiates constantly at its full power level but the frequency of the carrier waves is swung above and below the nominal value, in accordance with the signals to be transmitted. This new method of operation has been adopted by a number of broadcasting and relay stations, notably the experimental plant of Professor E. H. Armstrong, of Columbia university, and shows promise of wide further application. The importance and practical value of the system are due primarily to its inherent noise-reducing characteristics, by means of which it discriminates against not only radio interference from lightning, but the electrical disturbances due to automobile ignition, diathermy, and so forth, which have heretofore been the *bête noire* of ultra-high-frequency radio transmission of sound, facsimile and television. During the year 1939, transmission by wide-band frequency-modulation, on waves of approximately 43 megacycles per second, has been so completely and repeatedly tested under service conditions, and with such success, that its future wide-spread application to broadcasting and other radio services would seem to be assured. (See also ADVERTISING; AIRPORTS; BROADCASTING; RADIO, INDUSTRIAL ASPECTS OF; TELEVISION.)

(J. V. L. H.)

Radio Facsimile: see RADIO, SCIENTIFIC DEVELOPMENTS OF.

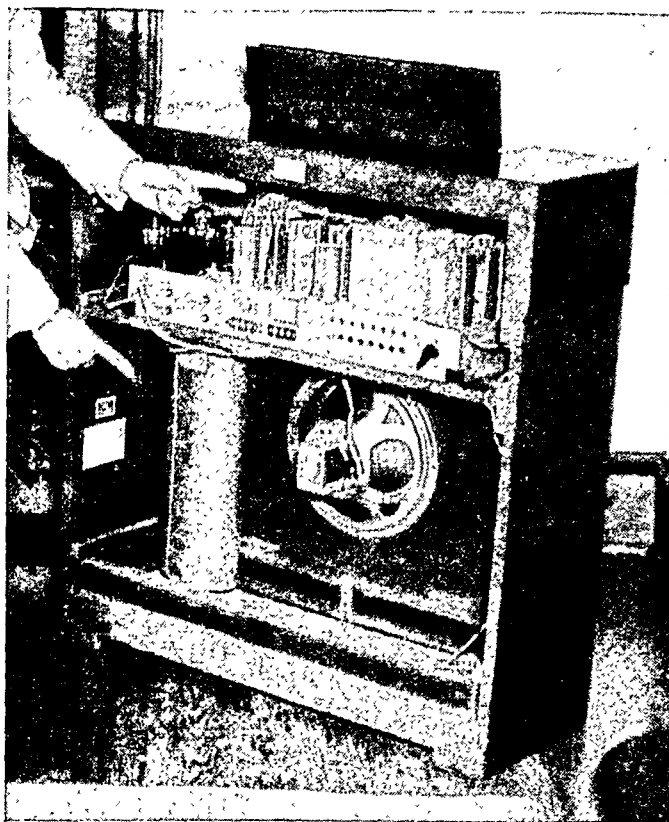
Radiology.

During 1939 the intimate study of radiation effects on the living normal and tumour cell was intensified. Increase in the voltage and intensity of X-rays, while offering profound tissue effects has not materially improved the statistics of cancer mortality. Ambitious attempts with artificial radioactivity by means of the cyclotron have shown profound effects on experimental animals but these effects are not as yet transposed or transferred into human equations of value.

Radiation Therapy for Infections.—Satisfactory radiation in many inflammatory diseases of the skin and of organs, such as boils, carbuncles, erysipelas, parotitis, mastoiditis and other glandular infections, has provided an elaborate literature lately. Gas bacillus infections are included.

Cine-roentgenography.—The manufacture of extremely rapid photographic film and the construction of fluoroscopic screens of increased fluorescence have led to two important advances in radiology. Cine-roentgenography by the indirect method consists in photographing the fluoroscopic image by means of a motion picture camera equipped with a special lens (F/0.85, focal length 5.5 cm.).

The ability to study the circulating blood stream by cine-roentgenography has produced discoveries in the physiology of the



NO AERIAL OR GROUND WIRES are required in this radio set, developed in 1939

foetal blood circulation. The transitional stage between the foetal and adult types of circulation has been studied by Barclay in new-born lambs. Barclay is the first to study the foetal circulation and, what is more important, the transition from foetal to adult circulation in the new born.

Photo-roentgenography.—The indirect method of photo-roentgenography has been developed to practical usefulness in the roentgen examination of tuberculous patients in clinics and sanatoria where the use of large films for each patient becomes an item of great expense.

This method will compete with non-transparent paper film both in expense and diagnostic values.

Ordinary or cinematographic cameras are incorporated in the apparatus. If very small films are used they may be enlarged or projected to a larger size for interpretation. If a 4x5 photographic film is used in the camera that photographs the fluoroscopic image produced by the X-ray exposure, then the film costs will be cut one-eleventh. Not only the film costs but the filing costs are greatly decreased.

The advantages of X-ray examinations of the chest in tuberculosis clinics and in the survey of industrial workmen in hazardous dust occupations are now quite well established. This method has been recommended for the roentgen examination of large groups of school children, soldiers, sailors, hospital personnel. It is advisable that the usual large film examination be completed for the more accurate diagnosis of those cases which this rapid and cheap survey method culls from the larger groups.

Body-section Roentgenography.—This generic term has been applied to the various methods which seek to radiograph a selected layer of the body to the exclusion of all other layers. Priority claims are quite chaotic although an article by Keiffer furnishes a complete record and mathematical analysis of the principles involved. Specific terms such as stratigraphy, tomography, planigraphy, vertigraphy and laminagraphy are identified by the me-

chanical devices which seek to apply the principle of body-section radiography, to wit: "If a source of visible light and a recording medium be revolved about a fixed axis, the shadow of any object in this axis will maintain a constant relationship to the light and the recording medium." The practical application of this principle was extended considerably during 1939, and it offered considerable advantage over ordinary exposures, especially about the head, neck and chest.

Retroperitoneal lymph nodes—Lymphoblastoma.—Desjardins focuses attention upon the importance of the retroperitoneal lymph nodes in cases of malignant tumours. In cases of lymphoblastoma (Hodgkin's disease and lymphosarcoma) he indicates the diagnostic value of roentgen therapy; the prognostic value of the rate of regression; and cautions concerning the untoward effect of excessive quantitative doses of roentgen therapy. He especially erects a symptomatology of abdominal lymph gland involvement in carcinoma as a primary or metastatic display and the possibility of confusion in the diagnosis of secondary retroperitoneal gland enlargements after the removal of ovarian or testicular new growths. (See also X-RAY.)

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Radiotherapy: see RADIOLOGY.

Radium. When the world's supply of radium was obtained from the comparatively lean ores of Czecho-Slovakia, the United States, Australia and Portugal, the price of the product was \$100,000 or more per gram; the discovery of much richer ores in the Belgian Congo brought the price down to \$70,000, and with the collapse of world buying power in 1929 it was reduced to \$50,000; new deposits of unparalleled richness have been discovered in Canada, and since the construction of a refinery for their treatment the official quotation has been cut to \$40,000, but it is reported that purchases could be made at \$25,000, or even as low as \$20,000 in quantity.

Production of refined radium salts began in Canada in 1933, with 3.0 grams of radium content, but later additions to the refinery have greatly expanded the operations. In 1937, the milling of 23,838 short tons of ore yielded 475 tons of pitchblende concentrates, from 290 tons of which 23,868 grams of radium were recovered.

Press reports give the 1938 output at 70 grams and the rate of operation at 9 grams monthly. The entire output is shipped to England for measuring and packing into treatment needles, after which much of it is returned to Canada for sale. It has been reported that Congo and Canadian producers have agreed on a division of the market on a 60:40 basis. Although the radium-bearing ores of Colorado and Utah have been mined on an increasing scale during the past two or three years, this is primarily for their vanadium content, and little radium is recovered.

The United States is the largest consumer of radium, and imports have increased heavily; during the decade 1928-1937 imports of radium salts totalled 138.32 grams; during 1938 the imports rose to 38.75 grams, and in nine months of 1939 to 70.5 grams, an amount in excess of the entire world output only a few years earlier.

(See also STANDARDS, NATIONAL BUREAU OF; STERILIZATION; VANADIUM.) (G. A. Ro.)

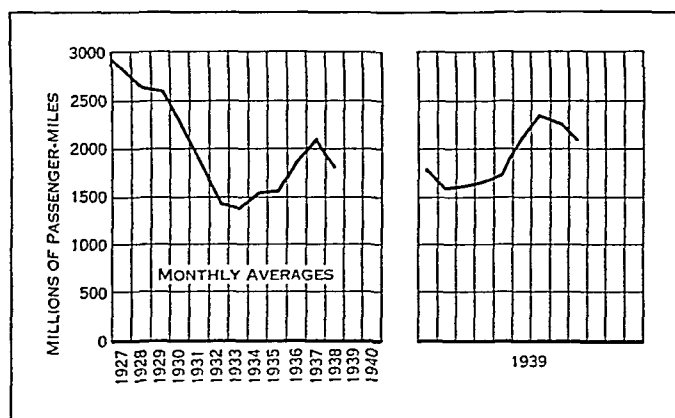
Railroad Accidents: see DISASTERS.

Railroads. The railroads of the United States, considered collectively, fared much better in 1939 than in the critical year 1938. In 1939 they earned their fixed charges and had a surplus of about \$95,000,000. In the preceding year they failed by \$123,000,000 to earn their fixed charges. They were, therefore, \$218,000,000 better off in 1939 but the surplus of \$95,000,000 after fixed charges is a painfully small amount to meet the needs of additions and betterments that should be financed from income and to satisfy the dividend-hungry holders of approximately \$8,000,000,000 par value of railroad stocks. Stated in other terms the 1939 net railway operating income, the part of operating revenues left after the payment of expenses and taxes, was equivalent to a return of 2.26% on the book value of road and equipment, the working cash balance, and the investment in materials and supplies. The rate of return in 1938 was 1.43%. The Interstate Commerce Commission in 1922 defined a fair return as 5.75%. The Commission has found that the physical value of railroad properties is slightly in excess of the net capitalization and that from that viewpoint the railroads collectively are not overcapitalized, yet the 1939 return of but 2.26% on that value, if continued, would mean insolvency on a greater scale than now exists.

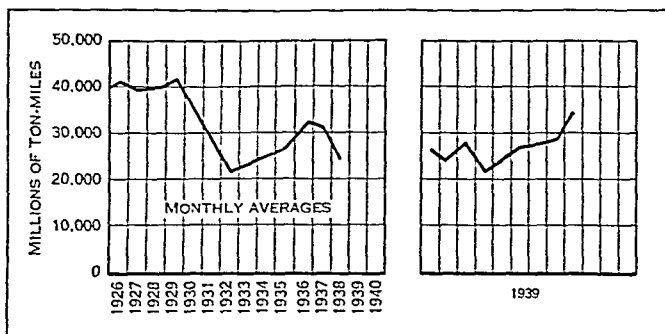
The situation with respect to insolvency changed but slightly during the year. At the beginning of 1939 the mileage of all railroads in equity receivership, or in reorganization under Section 77 of the Bankruptcy Act, was 76,938. At the end of the year it was 77,414, an increase of 476 miles. The percentage of mileage in bankruptcy proceedings at the end of the year was 31% of the total railroad mileage of all classes. For Class I railroads alone (those with operating revenues of \$1,000,000 or more) the percentage was 32.1%. In that class are 39 bankrupt railroads. Their investment value is 27.7% of the total of Class I; their capital stock, 26.4%; their funded debt, 32.4%; their operating revenues, 23.9%; and the number of their employees, 25.9%. The disparity between the percentages of capital stock and of funded debt is of significance inasmuch as it indicates that the bankrupt roads collectively are those whose bonds form too large a part of the total capitalization.

While no Class I railroad emerged from bankruptcy proceedings during 1939, some progress in reorganization has been made. Plans for three Class I properties were promulgated by the Interstate Commerce Commission and approved by the courts but have not been finally confirmed by all interests. Other plans are going through the procedural steps. Of the plans for 21 properties, either approved by the Commission or proposed by its examiners, the capital structure of the new companies would reflect reductions of about 60% in funded debt and about 75% in annual fixed charges.

While the depressed state of business in general explains in



CLASS I RAILROADS, United States: Revenue passengers carried one mile



CLASS I RAILROADS, United States: tons of freight carried one mile

greater part the recent serious impairment in railroad earning power, the effective growth of competing forms of transportation accounts for a substantial part of the railroad loss. Supported in the main by governmental subsidy the inland waterways are taking a large amount of the low grade commodities which do not require expedited service. Subsidized in part, the trucks are cutting heavily into high grade and some low grade commodities and the buses are attracting the thrifty passengers who formerly travelled by rail. The pipe lines are constantly being extended and are moving petroleum and its products in large quantities. The passenger traffic by aeroplane has shown a spectacular growth during 1939 and the railroads are losing heavily in passengers who formerly patronized the excess fare trains. And finally the amount of private transportation—passengers in their own automobiles, manufacturers and merchants operating their own trucks, and barges, and oil producers, refiners and distributors using their own pipe lines, trucks and barges—continues to increase and to divert traffic from the common carriers in all forms of commercial transportation. (See also AVIATION, CIVIL; MOTOR TRANSPORTATION.)

The railroads have been fighting hard to bring about what they call "equality of opportunity" in competition. They complain about subsidy to the operators on the inland waterways, on the highways, and in the air, and they ask for regulation of all of their competitors in a degree that corresponds to the regulation of railroads. Comprehensive legislation that would remove a substantial part of the competitive inequality came near to enactment in 1939. Bills, with approximately the same objectives, were passed by the Senate and the House, but the differences in detail could not be reconciled in the conferences of the joint committee before Congress adjourned. These bills were on the calendar of the 1940 Congress, the conference committee was at work, and there was ground for the hope that something will be done by Congress in 1940. The question on which there is controversy in greatest degree is that of subjecting water carriers to more intensive public regulation.

To improve their competitive position in other important respects the railroads made strides in 1939 in improving the quality of their service. The number of modern streamline passenger trains, moving at high speed, has been increased from 62 to 82 and many innovations have been introduced to make travel by rail more comfortable and attractive, in coaches as well as in sleepers and parlor cars. Freight service has been expedited and many bold experiments are being tried both in rates and in service. Operating efficiency is on a higher plane and several new records have been established, such as in ton-miles per train-hour and ton-miles per freight car day.

When the certainty of war on an extensive scale was seen in the invasion of Poland, there was doubt whether American railroads would be capable of taking care of their part of increased industrial activities. The beginning of the war undoubtedly had an

important influence in the sharp increase in American railroad traffic in October and November. Notwithstanding the curtailment in expenditures for maintenance and a marked slowing up in the normal program for additions and betterments during the depression, the railroads were able to handle the heavier volume of traffic satisfactorily and the urge to provide more locomotives and cars and the improved earnings which made available more funds for the purpose, resulted in a comprehensive program to recondition the idle locomotives and freight cars, and to acquire new equipment by purchase from the locomotive and car builders. At the close of 1939, therefore, there was basis for the prediction that the railroads will not be found wanting in 1940.

In contrast with many of the other large industries the railroads went through the year 1939 without a strike or other labour controversy. It should be noted, however, that the freedom from conflict must be a source of greater satisfaction to labour than to management inasmuch as the decisions of the governmental agencies have, in the main, been to the advantage of labour.

The operating results of Class I railroads (as shown in the Jan. 6, 1940, annual statistical issue of the *Railway Age*) in 1929, the year of greatest operating revenues; in 1934, a year midway in the depression; and 1939, afford comparisons of three periods five years apart. The results in 1939 are strikingly unfavourable in comparison with those of 1929, but the opposite is true of the comparison of 1939 with 1934.

Operating Results, Class I Railroads, 1929, 1934, 1939 (U.S.)
(in Millions)

Item	1929	1934	1939*	Per Cent Incr. or Decr. 1939 compared with	
				1929	1934
Operating revenues	\$6,278	\$3,270	\$4,020	-36.0	+22.9
Operating expenses	4,506	2,442	2,025	-35.1	+10.8
Net operating revenue	1,772	829	1,095	-38.2	+32.0
Taxes	397	240	365	-8.0	+52.3
Equipment rents	95	90	95	-0.4	+5.7
Joint facility rents	29	36	35	+22.8	-4.0
Net ry. operating income	1,252	463	600	-52.1	+29.7
Other income	360	203	150	-58.3	-26.2
Misc. deductions	22	18	23	+4.6	+29.9
Income available for fixed charges	1,589	648	727	-54.3	+12.2
Fixed charges	680	653	619	-9.0	-5.1
Income after fixed charges	909	57	108	-88.2	...
Contingent charges	12	12	12	+2.3	+4.2
Net income	897	17†	95	-89.4	...

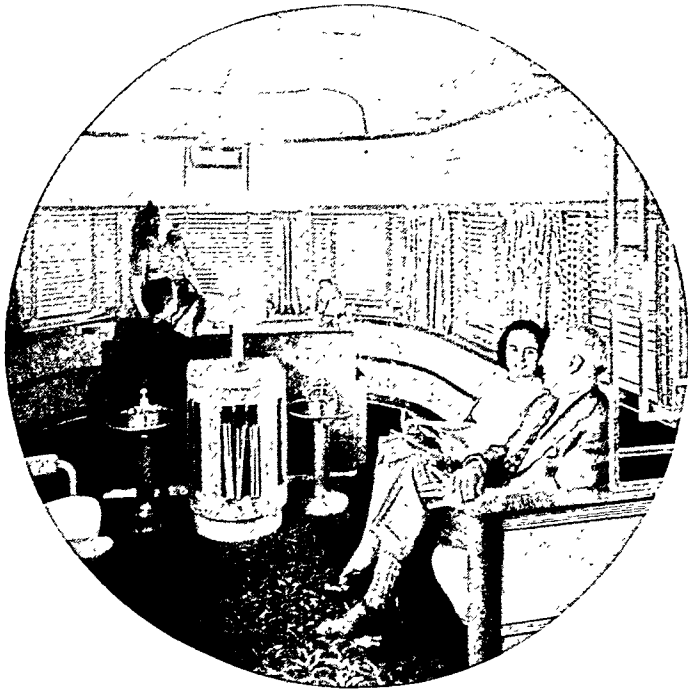
*Estimated in part. †Deficit.

(W. J. C.)

Europe.—The cataclysm of a European war has, of necessity, delayed progress after the end of August 1939, and a general note outlining the methods by which European railways of both belligerent and neutral countries adjusted themselves to the changed conditions will be found hereunder. The following sections applying to individual countries relate, therefore, only to the peace-time period Jan.-Aug. 1939, so far as the European railway systems are concerned.

Great Britain.—There were very few changes in passenger train services as a result of the inauguration of the summer services, and, while the total daily mileage at start to stop speeds of a mile a minute reached the 12,000mi. figure for the first time, there was a slight decrease in mileage daily covered at 64 m.p.h. and over. The London and North Eastern railway streamliners and the "Cheltenham Flyer" alone exceeded the 70 m.p.h. throughout average.

In other respects, however, the year 1939 has not been devoid of railway progress: for instance, the Southern railway completed its 1935 electrification project, embracing 612 track miles, by changing over from steam to electric traction on its lines from Swanley and Gravesend to Maidstone, Rochester and Gillingham on June 30. The standard Southern railway system of 660 volts D.C., using third rail feed, was utilized and two-car sets of unusual



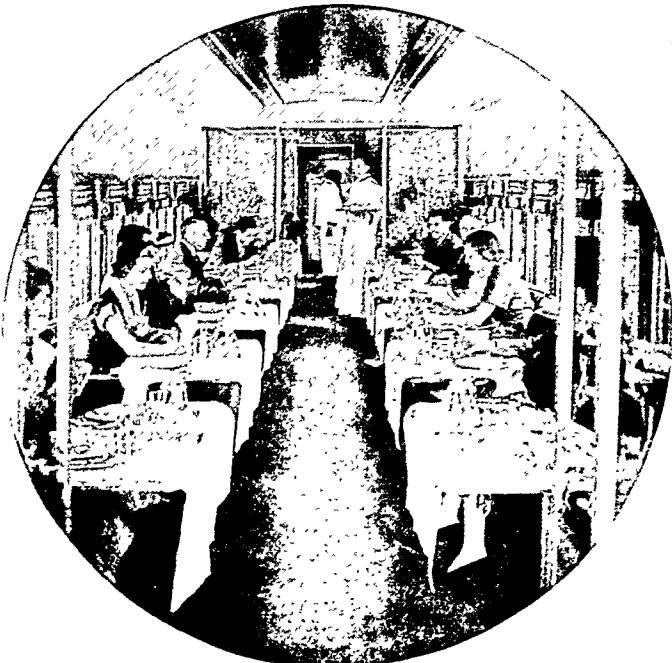
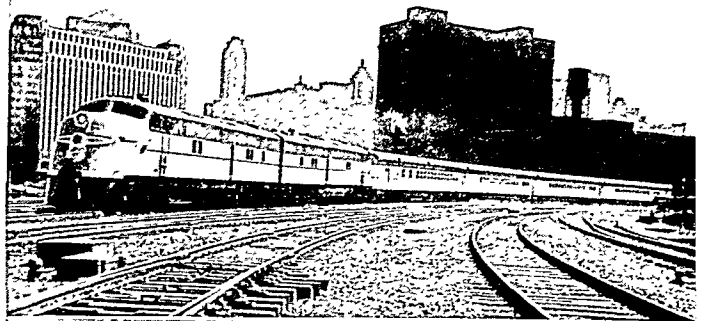
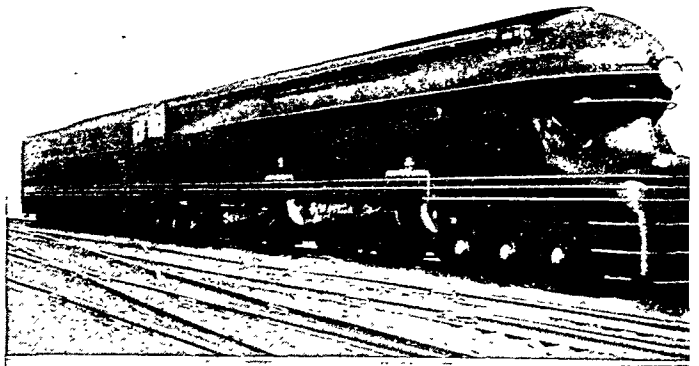
Upper circle: A SPEEDOMETER FOR PASSENGERS is one feature of the new "400" streamliner which began service between Chicago and Minneapolis in Sept. 1939

Above, right: ALL-COACH OVERNIGHT TRAIN, "The Pacemaker," which began operation on the New York Central System between New York city and Chicago in July 1939

Upper centre: LARGEST, FASTEST, and most powerful of its kind, this "Pennsylvania Type" steam locomotive completed in 1939 can haul 1,200 tons at a sustained speed of more than 100 miles per hour
Lower centre: THE "400," streamliner of the Chicago and North Western, was placed in daily service in Sept. 1939 between Chicago and Minneapolis

Lower circle: DINING CAR of the New York Central's streamliner "The Mercury," christened Nov. 3, 1939, before its maiden trip between Chicago and Detroit

Below, right: THE "CORONATION SCOT," Britain's most famous streamliner, runs beside the "Royal Blue" of the Baltimore and Ohio before being placed on exhibition in 1939 at the New York World's Fair



width were constructed for the service, operating as 4, 6 or 8-car trains. Progress was also made with the suburban and main-line electrification schemes of the London and North Eastern railway, the former covering the London (Liverpool Street)—Shenfield and allied services and the latter concerning the main-line over the Pennine Range between Sheffield and Manchester. The former is to be operated by multiple unit trains and the latter by electric locomotives. Both were due for completion in 1940 but may be held up indefinitely as a result of the outbreak of war. As a result of the rising price of coal the Great Western railway early in 1938 undertook a study of the financial prospects likely to be achieved from a conversion from steam to electric traction of its main-line from Taunton to Penzance with the respective branches. The resulting survey was made public in 1939, and conclusively proved that under British conditions main-line electrification is only a successful financial proposition where special characteristics exist, as for instance the Woodhead tunnel on the Manchester-Sheffield section, London and North Eastern railway. The completion of certain very important resignalling schemes can be recorded, notably that at Victoria, Southern railway, where three signal cabins were replaced in June by one all-electric 225 lever-frame cabin in conjunction with the use of colour light signals. Another installation, completed in May, was that at Darlington, London and North Eastern railway, with a 155 lever-frame, the point operation being all-electric.

The reconstruction of the largest London Midland and Scottish railway classification yard at Toton was completed in May, and since then Frölich type rail brakes, as in use at Whitemoor and Hull, London and North Eastern railway, have been controlling the braking of wagons on the down side. Toton deals mainly with coal traffic and can deal with 7,500 wagons per working day. A feature of British railway policy of recent years, and one different from that of other European countries has been the construction of large numbers of passenger cars for local, suburban and country branch line services as well as for main-line services. This policy has been continued with excellent results and has done much to retain passenger traffic on secondary lines. The same policy has been adopted in regard to locomotives and, while large numbers of standard type main-line locomotives continued to be turned out, new locomotive power for branch lines has not been neglected. The reliability of modern steam locomotive designs is well illustrated by the fact that one 3-cylinder streamlined London and North Eastern railway "Pacific" worked the "Coronation" express for 39 consecutive trips, one of the fastest trains in the world; the punctuality of this train is remarkable, for in April and May its very fast schedule to Newcastle was adhered to on all but two occasions. Progress continues to be made with the program of linking up the London underground system with the main-lines, and the extension of the tube trains to Stanmore in November marked another stage in this huge program, commenced in 1935 and estimated to cost nearly £45,000,000.

Eire.—In Eire the placing in service of new 3-cylinder 4-6-0 type express locomotives has permitted a material reduction in the scheduled running time between Dublin and Cork, even with somewhat increased loads.

France.—There has been no outstanding feature of progress to record on the French National railways other than the official opening of the last electrified section of the Paris-Orleans railway between Tours and Bordeaux in the early spring of 1939. This link gives the French National an electrified main-line throughout from Paris to Bordeaux and the Spanish frontier at Hendaye. The Sud Express was timed to cover this 362½ mi. to Bordeaux at an average of 64.1 m.p.h. On other main-lines deceleration and suppression of trains was the order of the day, notably the elimination of the fast rail cars to Havre, and the streamlined steam express between

Paris and Lyons. The financial position of the French railway system has been a drain on the national finances for many years and these reductions in service were made for the sake of economy.

Germany.—The summer timetables in Germany, on the other hand, included a number of new Diesel flyers, 16 services of this type in all being operated; in the case of the "Flying Kölner" the bookings between Berlin and Hanover and then to Hamm were at 83.2 and 83.1 m.p.h. respectively, the fastest regular rail timings in the world prior to the outbreak of war. Germany's claim to a world speed record on rails is substantiated by the test run of the articulated "Flying Fish" 3-car Diesel unit, which attained 133.6 m.p.h. on the Berlin-Hamburg line on June 26. The German rolling stock construction program for 1939 included orders for over 1,000 locomotives, a large increase over the output for the immediately preceding years.

Italy.—With the inauguration of the summer train services in 1939 the Italian State railways virtually revolutionized their passenger schedules, with runs averaging 65.5 m.p.h. over the 392.8 miles between Milan and Rome, and similar speeds on to Naples including intermediate stops; in fact Italy could claim daily a mileage of 1,187 at over 70 m.p.h. and 7,147 mi. at over 60 miles per hour. Most of these services are operated with light electric multiple unit sets, but there are also many fast light Diesel units. Electrification is being extended rapidly and in October the Italian section of the Gotthard route was converted to electric traction.

Other European Countries.—Holland celebrated its railway centenary in 1939 and few countries could claim to have so revolutionized their passenger services during any 12 months. During 1938-39 further high speed Diesel trains have been inaugurated running to Groningen, Oldenzaal and Maastricht on even internal services, while multiple unit electric sets cover the routes carrying denser traffic, namely Eindhoven, Arnhem, Amsterdam and Rotterdam. In Denmark further improvements were made in the Diesel "Lightning" train services, thanks to the inauguration of a new train ferry across the Great Belt, and the State railways could claim 26 daily runs at over 58 m.p.h., a remarkable achievement for a small country. Two other large bridges are under construction, one at Ulvsund and another at Limfjord. Norway is one of the few European countries still engaged in railway construction and, like Sweden, is turning steadily to electric traction. Switzerland built one of the most powerful electric locomotives in the world, rated at 12,000 h.p., and improved the speed of its inter-city services. The Belgian National railways placed in service some very fast light steam trains between Brussels and Ostend, the 57.7 miles from Brussels to Bruges being run in 46 minutes, 75.3 m.p.h.; streamlined "Atlantic" type locomotives were built for this service. Additional mileage was electrified on the Antwerp-Brussels route.

European Railways and the War.—As a result of the European war the Polish State railway system has disappeared, some of its lines being absorbed in the Oppeln and Koenigsberg divisions and others forming the new Posen division of the German railway; Eastern Polish lines were taken over by the Soviet authorities. In all the countries concerned Diesel traction for a time virtually disappeared owing to the scarcity of oil, and many passenger trains hauled by steam and electric power had to be cancelled in order that the additional freight traffic due to the war could be handled expeditiously. The operating difficulties caused by the "black-out" for fear of air raids proved serious and the passenger trains could only be illuminated internally by blue lamps. The war caused a complete revolution in traffic routing, while the dangers at sea diverted to the railways large volumes of traffic normally water borne.

Asia.—Construction is due for completion in 1940 of the railway connecting Turkey with Baghdad via Mosul, bringing Iraq into rail communication with Europe whenever a train-ferry service is inaugurated across the Bosphorus. From Erzincan the line to Erzerum was opened by November, 1939, linking the Turkish and U.S.S.R. railways. One of a series of bad accidents on the Indian railways caused the appointment of a special committee, headed by Lt. Col. Mount of the British Ministry of Transport, assisted by British and French engineering experts. The Mount committee's report in July, resulting from the Bihta accident on the East India railway, is one of the most important contributions to the study of locomotive movements at speed produced during recent years. In the Far East there has been considerable activity in the opening of new lines in Manchoukuo and Russian Siberia.

Africa.—After a long series of prosperous years, during which the South African railways administration had difficulty in handling the traffic offering, 1939 witnessed some retrogression, but the conservative financial policy adopted, together with enormous increases made recently in regard to rolling stock, have served to build up a well-equipped railway system with a large proportion of its mileage, both main-line and suburban, electrified in accordance with the most modern practice. Both on the 3 ft. 6 in. South African lines and on the Kenya and Uganda railways the Garratt type locomotive has proved useful, permitting enhanced tractive power in relation to the limited axle load allowed. Some new Garratts for the Kenya and Uganda railways of 4-8-4+4-8-4 type are believed to be the heaviest locomotives operating on 50 lb. per yard rails, since they weigh 186 tons and lift trains from sea level over two summits, one 7,857 ft. just beyond Nairobi, another of 9,130 ft. 525 mi. from Mombasa. These new engines run from Nairobi to Kampala and back in 24 hours, a distance of 1,100 miles.

Australia and New Zealand.—The famous "Spirit of Progress" express of the Victorian Government railways, with all-metal rolling stock of a design unique in Australia, has earned considerable fame with its non-stop run on week days between Melbourne and Albury, 190¾ miles. The New South Wales railways have also speeded up their services; specific mention should be made of that system's Diesel unit, the "Silver City Comet," running on the Broken Hill-Sidney line. The transcontinental service to and from Western Australia has been improved, and, in another sphere, Victorian railways have made railway history by their pioneering achievement in regard to welding of rails into long lengths. The New Zealand Government railways continue construction of new rail links connecting various detached sections; one such line is in the North Island between

Palmerston North and Napier, but work will not be completed for some years. Large numbers of new 4-8-4 type locomotives, weighing 140 tons are being placed in service, permitting much heavier loads to be handled.

South America.—The development of Diesel trains and railcars continues on the various Argentine railways and in neighbouring countries, but the acceleration of steam services has not been neglected; there has been considerable speeding up on the Central Argentine main-line. Railway construction has not ceased in South America, over 600mi. being under construction, Brazil accounting for over one-third. In the same country further mileage is being electrified.

Canada.—After a long period of declining traffics the two great Canadian railways experienced a rapid revival of prosperity during 1939, thanks to absence of droughts and increased industrial activity resulting from the European war. There has been little reference in 1939 to alleged redundancy of mileage and rolling stock which was the object of criticism in earlier years: in fact both Canadian lines have placed large orders for equipment to deal with traffic offering. Their Majesties' visit called for masterful organizing ability by the Canadian National and Canadian Pacific, the specially prepared train covering 8,377mi., some of it in the Eastern States; there was no operating hitch, one locomotive hauling the train throughout from Quebec to Vancouver. (See also BANKRUPTCY; DISASTERS: Railroads; UNITED STATES: Transportation.) (C. E. R. S.)

Rainfall: see METEOROLOGY; FLOODS AND FLOOD CONTROL.

Raisins: see GRAPES.

Rapid Transit: see ELECTRIC TRANSPORTATION.

Rates of Exchange: see EXCHANGE RATES.

"Rawalpindi": see EUROPEAN WAR: *The War at Sea*; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Rayon. The newest of the fibres continued to hold the centre of textile interest in 1939 as its total production increased 13.6% in filament yarn and 7.1% in staple fibre. Consumption in the United States, the chief producing and consuming country, reached a new high. The 1939 United States consumption figure was estimated at 356,000,000lb. of rayon yarn and 100,000,000lb. of rayon staple. This represents an increase of 82,000,000lb. over 1938 consumption of rayon yarn and an increase of 47,000,000lb. of rayon staple. Both figures are the largest ever known and are indicative of the rising tide of rayon.

The greatest percentage of gain was made in staple fibre which produces fabrics with the softness of wool and the dull lustre of silk. The men's wear fabrics of staple rayon made heavy inroads into the wool territory. In the United States, production increased 76.7% in 1939, and in Great Britain the increase was 93.5%. A new field of use for the staple fibre was the carpet and rug industry. Previously, the tendency of rayon to stay permanently crushed made it impractical for rugs or floor coverings. But constant improvements through experimentation and research have developed a fibre that resists footsteps. Rayon having invaded the cotton and silk markets, its conquest of wool seems well under way. In linen competition, shortage of flax supplies because of war conditions in the chief sources of supply, Russia, Poland, and adjacent countries, gives rayon an opportunity to make further progress during 1940.

In table damask, rayon is already popular, as it enhances the design and is washable.

Rayon made notable progress in 1939 in the hosiery field. For the past five years, hosiery has been considered the last remaining stronghold of silk because rayon did not have the required elasticity for full-fashioned knitting. As long as silk stayed at relatively low prices, there was little inducement on the part of the hosiery manufacturer to experiment with rayon yarns. In the meantime, however, rayon yarn manufacturers were continuing to improve their product with the hosiery goal in view and 1939 gave them the opportunity to show what had been accomplished. The price of silk increased so rapidly and unreasonably in the latter part of the year that hosiery manufacturers sought relief. The first interest was in nylon. The publicity attendant upon nylon, as shown at the DuPont industries exhibit at the New York World's Fair made nylon hosiery a necessity for any retailer during 1940. The many superior features of nylon hosiery, the

Rayon Production

	Filament Yarn (1000s of lb.)		Staple Fibre (1000s of lb.)	
	1939	Compared to 1938	1939	Compared to 1938
United States . .	331,000	+28.8%	53,000	+76.7%
Japan	230,000	+10.0%	275,000	+26.7%
Germany	160,000	+13.5%	450,000	+36.4%
Italy	120,000	+18.8%	180,000	+8.4%
France	65,000	+6.6%	not available	..
Total	1,125,000	+13.6%	1,025,000	+7.1%

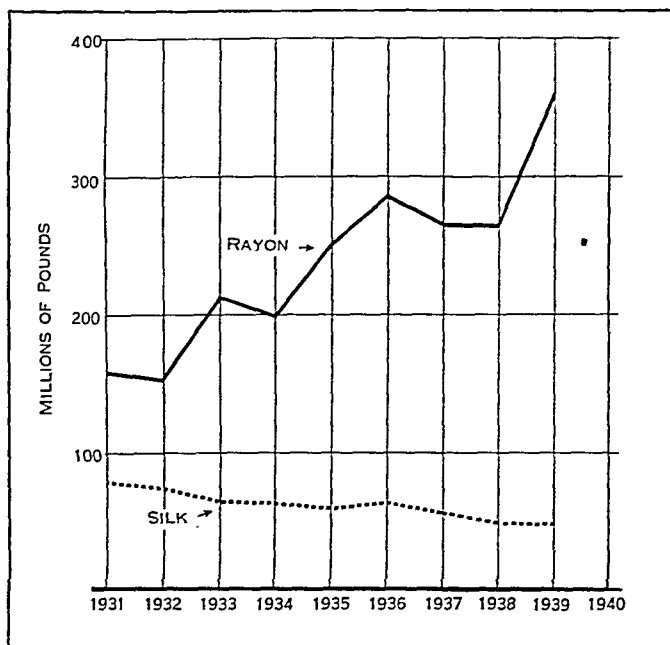
result of actual wear tests over a period of a year, aroused interest throughout the world and in Nov. 1939, the hosiery was placed on sale, as an experiment, in six Wilmington, Del. stores at prices generally above the average price of silk hosiery. During the first three days of the sale, it was reported in the *Underwear and Hosiery Review*, practically no other full-fashioned hosiery was sold.

Other local stores not having nylon suffered losses in their hosiery volume.

An improved rayon cuprammonium yarn for hosiery was also ready for hosiery.

Another new fibre in the synthetic field was *vinylon*, a plastic material like nylon, but manufactured under a different process by the Viscose Company. It is produced from a resin of the vinyl group. This yarn is being featured for industrial use, sewing threads, pressed felts. Because of its resistance to alkalis and mineral acids, as well as moisture, mould and mildew, vinylon yarn is expected to play an important part in industrial cloths of many descriptions. Its resistance to ignition makes it desirable for the furniture and interior decoration field. The year 1939 saw its presentation principally in upholstery fabrics, duck and filter cloths.

Glass fibre received almost equal publicity in 1939. Fibre glass shower curtains and window draperies were shown at the New York World's Fair and retail stores in the larger cities reported a demand for them from consumers. Because of their relatively high cost at the present time, the demand is limited but their practically life-time wear, resistance to fire, cold and heat, and non-fading qualities will probably overcome the price differential.



RAYON AND SILK CONSUMED in the United States

In addition to new fibres, the rayon industry took another step in creating its own identity and minimizing its characterization as a "substitute." While the industry had adopted the term *rayon* instead of artificial silk for its generic name, the fabrics made from the yarn continued to be described by fabric names created by the older fibres. In 1939, a committee of producers and wholesalers similar to the committee which coined the name rayon, prepared suggestions for renaming some of the more established rayon fabrics. *Trossach* was adopted for fabrics of the tweed family of combination yarns of rayon and wool and having cross-dye properties. Fabrics hitherto called *taffeta* and *pigment taffeta* were described as *twalle*, an Anglicized version of the French *toile*, meaning a plain weave. The official definition of *twalle* is "a fabric made of filament rayon with normal twist. Where *voile* twist is used, the fabric should be referred to as *crepe twalle*." The name *grenai* was selected for what had been previously described as *alpaca*. The official definition is "the dress fabric of filament yarns, two-ply warp and filling of viscose crepe twist and acetate normal twist." The origin of the term is the term *grenadine* which refers to a tightly twisted crepe yarn. At the close of 1939, with fabrics almost completely turned over to rayon and with hosiery about to do so, rayon was rapidly reaching the place of first importance in the world's textile demands. (See also CELLULOSE PRODUCTS; INDUSTRIAL RESEARCH; RUBBER AND RUBBER MANUFACTURE; SILK AND SILK MANUFACTURE; TEXTILE INDUSTRY.) (I. L. BL.)

Read, Opie (1852-1939), U.S. author and humorist, was born December 22 at Nashville, Tenn. and spent his boyhood on his father's farm near there. At the age of 21 he went to Franklin, Ky. to work for a newspaper and in the meantime completed his college studies. From 1878 to 1881 he was editor of *The Arkansas Gazette* at Little Rock, and during the next two years he was on the editorial staff of *The Cleveland Leader*. Then he returned to Little Rock, where in 1883 he founded *The Arkansas Traveler*, a publication that became famous for its mélange of wit and cracker-barrel philosophy. He moved to Chicago in 1887, continued publication of the *Traveler* there for four years, and began work on a series of novels. Among his works are *A Kentucky Colonel* (1889), *A Tennessee Judge* (1893), *An Arkansas Planter* (1896), and *On the Suwannee River* (1900). Read died at Chicago November 2.

Reciprocal Trade Agreements: see TRADE AGREEMENTS.

Reclamation: see CANALS AND INLAND WATERWAYS; DRY FARMING; FLOODS AND FLOOD CONTROL; FORESTS; IRRIGATION; SOIL EROSION AND SOIL CONSERVATION.

Reconstruction Finance Corporation,

one of the 10 agencies comprising the Federal Loan Agency, under the supervision of the Federal Loan administrator, may perform all functions it is authorized to perform under law to close of June 30, 1941, or such earlier date as the President may authorize. It

was created by "an Act to provide emergency financing facilities for financial institutions, to aid in financing agriculture, commerce, and industry, and for other purposes," approved Jan. 22, 1932, which may be cited as the "Reconstruction Finance Corporation Act." The powers of the corporation were increased and the scope of its operations extended or otherwise affected by

Reconstruction Finance Corporation—Summary of Activities Feb. 2, 1932 through Dec. 31, 1939

	Authorizations	Disbursements	Repayments and Other Credits
For benefit of agriculture	\$ 2,442,863,320.83	\$ 1,449,279,036.77	\$1,444,722,156.77
To open banks to meet demands of depositors	1,334,873,736.15	1,138,233,619.27	1,067,395,271.76
For distribution to depositors in closed banks	1,343,004,584.28	994,003,504.24	945,519,142.97
For bank capital (including Export-Import Banks)	1,397,194,680.00	1,169,939,001.56	620,993,674.14
For self-liquidating projects (including PWA municipal securities)	1,032,388,080.12	832,322,863.06	646,093,987.30
To business enterprises	518,026,255.00†	211,237,323.07	79,419,970.34
To drainage, levee, and irrigation districts	144,907,227.23	88,729,001.06	4,731,047.27
To railroads (including PWA railroad securities)	1,372,192,085.54	864,394,000.60	394,959,748.31
For loans to and capital of mortgage loan companies (including \$25,000,000 capital The RFC Mortgage Company and \$11,000,000 capital Federal National Mortgage Association)	672,505,040.39	491,492,780.87	334,462,224.35
For loans to and capital of insurance companies	138,014,750.10	125,168,209.81	95,042,132.53
To building and loan associations (including receivers)	157,207,637.75	120,355,829.50	117,013,530.30
To public school authorities	24,636,300.00	22,579,500.00	22,303,500.00
Catastrophe rehabilitation loans	16,184,520.05	12,003,055.32	10,335,283.04
To State funds for insurance of deposits of public moneys	13,087,715.88	13,064,631.18	13,064,631.18
For mining, milling, and smelting businesses	14,013,100.00	5,087,800.00	2,385,087.55
For other purposes	3,005,115.62	614,813.85	599,271.27
Total—By Directors of the Corporation	\$10,626,895,058.93	\$ 7,539,395,980.06	\$5,808,731,659.98
Allocations and loans to other governmental agencies and for relief by direction of Congress	2,921,413,841.73	2,920,902,909.37	2,774,405,334.83‡
GRAND TOTAL	\$13,548,308,900.66	\$10,460,298,889.43	\$8,583,136,994.81*

*Includes \$31,782,291.12 credited on indebtedness for property taken over for debt.

†Total loans to business of RFC and participating banks, \$575,920,566.16. Banks participations \$80,543,354.30, including \$23,549,043.14 RFC loans taken up by banks.

‡Includes \$2,720,243,677.07 cancellation of Corporation's notes pursuant to Act of Congress approved Feb. 24, 1938.

subsequent legislation.

The corporation was organized and began operations on Feb. 2, 1932. (E. SM.)

Red Cross, the internationally recognized symbol of agencies in various countries for relief of sufferers in war and civil calamities. Particularly the device of the International Red Cross formed in Geneva in 1864 to which 63 national societies are signatory to organize impartial aid for sick and wounded in time of war, and the League of Red Cross Societies with headquarters recently moved to Geneva which specializes in peacetime relief work.

The American Red Cross was organized in 1881 and signed the Geneva Convention in 1882. It carries on extensive disaster relief operations and, since founding, has expended \$143,000,000 to aid the victims of 2,495 disasters the world over. It is supported entirely by public contributions and has never been Government financed. It sponsors the American Junior Red Cross with a school boy and girl membership of 7,556,306, and since 1914 has awarded life saving certificates to more than 1,000,000 persons completing training courses, and since 1910 more than 2,000,000 certificates to persons instructed in first aid technique. Certificates have also been issued to more than 1,000,000 women and older girls who have taken Red Cross instruction in how to care for the sick at home.

To combat accidental injuries and deaths the American Red Cross has established more than 5,000 emergency highway first aid stations and mobile units, and annually gives instruction to approximately 10,000,000 householders on the removal of hazards likely to cause home and farm accidents.

In 1939 the American Red Cross provided food, clothing, shelter, rescue, medical and nursing aid and rehabilitation assistance to 130,000 victims of 157 disasters in the United States at an expenditure of \$2,276,109.

During the same period Red Cross public health nurses gave care to 272,729 persons and made 1,046,933 visits on behalf of the sick. In their school and pre-school work these nurses co-operated

with doctors in examining 595,575 children. In 477 communities 655 Red Cross nurses carried on this essential work, and 1,826 graduate nurse instructors taught classes in home hygiene and care of the sick to 61,296 persons who passed examinations on the subject. The first reserve of the Red Cross nurses' reserve corps was swelled to 15,000 picked women ready to act in any emergency of peace or war, and the total Red Cross nurses' reserve corps numbered 44,283.

Volunteers served a total of 1,430,213 hours in such specialized work as producing 342,849 garments for the needy; 5,061,082 surgical dressings and 18,395 Christmas bags for U.S. soldiers, sailors and Marines stationed overseas, 890,093 pages printed in Braille for distribution among blind readers.

Through field directors stationed at Army, Navy, Marine Corps and Coast Guard stations and Red Cross chapters, help was given in 1939 to more than 51,000 enlisted men. Through Red Cross workers in 3,479 chapters 150,606 war-disabled veterans were helped and other Red Cross personnel dealt with the problems of 53,792 ex-service men and their families.

In 1939 Red Cross chapters aided 134,103 civilian families with social and financial guidance, and 202 nutritionists and food experts assisted 82 Red Cross chapters throughout the country in passing along information on the value of health-protecting foods and adequate diets.

The American Red Cross has expended more than \$200,000 in Spain for the relief of civilian refugees, to repatriate American citizens, to help civilians fleeing from Spain to France and to purchase Government flour and wheat at a nominal price to feed starving non-combatants in Spain. It has also expended \$814,000 for wheat, medicine and surgical supplies to relieve the suffering of non-combatants in China, a fourth of which was contributed from its own treasury and the balance contributed by the public.

In line with Red Cross treaty obligations, the American society offered war relief aid to the belligerent nations, following the German-Polish hostilities Sept. 1, 1939. A program of making surgical dressings, clothing for refugees, and hospital garments was inaugurated among the chapters in the United States for relief of the victims of warfare. This voluntary effort by chapters was supported by their communities. The national organization appropriated \$75,000 for Polish war relief and sent \$25,000 for use of the American hospital in France.

(G. S. Br.)

Referendum: see INITIATIVE AND REFERENDUM.

Reforestation: see FORESTS.

Reformed Church: see PRESBYTERIAN CHURCH.

Refrigeration Treatment (Cancer): see CANCER.

Refugees. Migrations of refugees during 1939 assumed unusual proportions. Military and political pressures intensified by the wars in Europe and the Far East uprooted millions of peoples from areas which they had occupied for generations. The 30,000,000 in China in continuing flight westward before the Japanese armies and the Spanish and Polish war refugees, quantitatively the greatest movements, were in the main internal migrations although some 400,000 Spanish refugees poured over the border into France and over 100,000 Polish refugees into Rumania, Hungary, and the Baltic countries. Refugees from Germany, Austria, and Czecho-Slovakia; Jews (non-Aryans), Protestants, Catholics, professionals, and members of outlawed political parties fled in increasing numbers from the persecutions and pressures of Nazi Germany which increased in ferocity and cruelty after the November riots in Germany in 1938.

Qualitatively the precipitate exodus from Germany heralding the outbreak of the war in Central Europe and disturbing to the peace and good order of other countries arrested world attention



DESOLATE CAMPS on French soil awaited the remnants of the Spanish Loyalist army in Catalonia after its flight across the border in Feb. 1939

in inverse ratio to the numbers of refugees involved. This was due in part also to the policies of the German Reich in fostering the spread of anti-Semitism in neighbouring countries and throughout the world, reducing thereby the limited opportunities for refugees to secure temporary admission to neighbouring countries or final settlement in overseas countries.

The previous migrations of the Turks, Greeks and Bulgarians planned and executed under bilateral treaties entered into by their governments presented lesser difficulties in contrast as these movements were to homelands where language, cultures and customs were familiar. On reaching their native countries these refugees were immediately accepted into their former citizenships and thus lost their character as refugees.

Russian and Armenian refugees, whose earlier flights had burst upon the world during a decade of rising economic activity, had in a sense set the patterns of refugee life for the German refugees. They had experienced the disadvantages of statelessness and the inhospitality of governments whose growing nationalisms tended to exclude the foreigner or to admit him only to uncertain civil status and the hardships of laborious employments.

The German, Austrian, Czech, Spanish and Polish refugees of 1939 were forced to find new homes in countries which had virtually closed their borders to immigration because of the depression in industry and agriculture, failure of domestic and foreign markets, and extensive unemployment. Throughout the world there was a population drift in process from rural areas into the cities to which it was assumed new immigrants would flock. The professional and urban character of the refugees seeking entrance confirmed the publics in the receiving countries in their fears of accretions to their urban populations. Considerations of the potential absorptive capacities of the receiving countries were too theoretical to induce them to admit thousands of newcomers who might bring with them racial, religious and economic conflicts of the Old World. In these world circumstances the refugees of 1939 found limited surcease in transit countries when admitted temporarily on humanitarian grounds and faced the necessity of immediate re-emigration to overseas countries for final settlement.

The refugees who had left Germany and Austria before the November riots of 1938 numbered approximately 130,000. At that time some 35,000 remained unassimilated in Western European countries. The annual rate of exodus from Germany had been 25,000.

During 1939 pressures in Germany were intensified enormously. In March when the German army moved into Prague German refugees previously resident in Czecho-Slovakia had to flee again and thousands of Czech non-Aryans and political refugees were added. Just previously Polish Jews in the Old Reich had been driven penniless and without notice over the Polish border. In the earlier stages of the German movement the neighbouring countries of Western Europe had received refugees in the expectation that they would find final settlement overseas. In the early months of the year these countries were forced to close their frontiers tightly against the onslaught of refugees.

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relatives or friends to assist them to enter other countries in the process of infiltration could be admitted in any numbers. The application of immigration laws and procedures had become rigid throughout the world.

The German and Soviet invasions of Poland in Sept. 1939 added new millions of Poles and Jews to the restless wanderers in Europe. Over 100,000 Polish refugees fled into the Baltic and Southern European countries while within Poland Jews fled over the new Soviet frontier. German efforts to establish a reservation for Jews with Lublin as a centre, to drive Poles and Jews from the Polish areas incorporated into the German Reich and to return Germans from the Baltic countries precipitated new cross currents of moving populations.

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Confronted with the still unsolved German refugee problem the officers of the Intergovernmental Committee meeting in Washington in Oct. 1939 were invited by the President of the United States to pursue more extensive studies and surveys of larger areas for the settlement of the millions of additional refugees envisaged as a result of the Central European war. The Second Conference of American States Members of the International Labour Organization meeting at Havana in Nov. 1939 considered the problems of refugees and adopted a comprehensive report aimed at facilitating migration for settlement. The Conference also voted to convene the Permanent International Committee on Migration to consider ways and means of financing large scale settlement at an early date. (See also ANTI-SEMITISM; CHILD WELFARE; CHILE; CUBA; JEWISH RELIGIOUS LIFE; LAW [Case]: *Aliens*.)

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in inverse ratio to the numbers of refugees involved. This was due in part also to the policies of the German Reich in fostering the spread of anti-Semitism in neighbouring countries and throughout the world, reducing thereby the limited opportunities for refugees to secure temporary admission to neighbouring countries or final settlement in overseas countries.

The previous migrations of the Turks, Greeks and Bulgarians planned and executed under bilateral treaties entered into by their governments presented lesser difficulties in contrast as these movements were to homelands where language, cultures and customs were familiar. On reaching their native countries these refugees were immediately accepted into their former citizenships and thus lost their character as refugees.

Russian and Armenian refugees, whose earlier flights had burst upon the world during a decade of rising economic activity, had in a sense set the patterns of refugee life for the German refugees. They had experienced the disadvantages of statelessness and the inhospitality of governments whose growing nationalisms tended to exclude the foreigner or to admit him only to uncertain civil status and the hardships of laborious employments.

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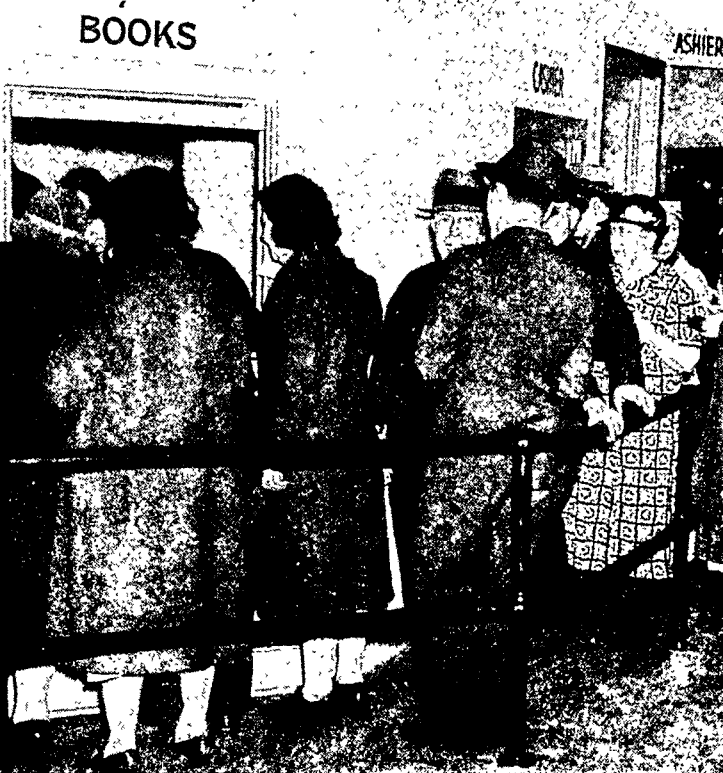
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A UNIQUE EXPERIMENT in relief was begun May 16, 1939, at Rochester, N.Y., to solve the dilemma of hungry citizens and surplus food. For each \$1.00 in "food stamps" purchased by relief clients, they received 50 cents' worth of stamps redeemable only for foods designated as "surplus"

ment. In that Province 46,506 or 86.5% of the Dominion total of 53,302 agricultural dependents reside.

The fiscal policies of the countries under review remained unchanged during the period under review. Great Britain alone paid all the cost of relief from current income; both Canada and the United States rely in part on borrowed money. Grants-in-aid by the central government to local units are provided by all three countries largely because the central governments alone have the necessary resources to meet the extraordinary relief demands.

Administration is decentralized in Canada, the Dominion Government laying down conditions to be met by localities to qualify for grants-in-aid; but localities taking responsibility for administration. In the United States there are three systems: WPA is wholly centralized; the categorical classes under the Social Security Act—blind, aged and children—are administered under grants-in-aid; general relief is left with localities, with State aid in some instances. In England, unemployment relief is centrally administered, with local, voluntary advisory committees; relief to others is under local administration, supervised by grants-in-aid from the central government to local authorities. (See also MUNICIPAL GOVERNMENT; SOCIAL SECURITY; UNEMPLOYMENT; WORKS PROGRESS ADMINISTRATION.)

BIBLIOGRAPHY.—*Social Security Bulletin*, Federal Social Security Board (Nov. 1939); *Report*, Unemployment Assistance Board (H.M.S.O. London, 1939); *Recipients of Material Aid*, Department of Labour (Ottawa, Canada, 1939). (F. J. B.)

Religion. The most important fact in the religious life of the Catholic Church during 1939 was the death on February 10 of Pope Pius XI, scholar, statesman and saint. His administration of his high office was a notable one, most of all for this, that it put an end to the long dispute between the curia and the quirinal and re-established the papacy as an independent political power, master in its own house.

Two political events during 1939 had an intimate bearing upon the fortunes of the Roman Church. The first was the ending of the Spanish Civil War by the victory of General Franco; the second, the outbreak of the European war with its consequence in the defeat and virtual annihilation of Poland as an independent

State. The Franco victory was welcomed by the Vatican, which from the first had shown its sympathy with the insurgents, a sympathy openly expressed when Pope Pius XII received the returning Italian troops at the Vatican and gave them his blessing "as defenders of civilization."

The Polish debacle, on the other hand, was recognized as a severe blow to the church; a blow all the more disastrous because it meant the transfer to Russia, and so exposure to the menace of bolshevism, of many millions of Polish Catholics.

In Germany, the strained conditions which had existed between the Government and the churches both Catholic and Protestant, still continued. But the repressive measures of the Government did not succeed in breaking the spirit of independence either of the Catholic bishops or of the independent Protestants. It is too soon to say what effect the outbreak of the European war will have on the relations of the Government to the churches. But it seems not unlikely that it will cause some relaxation of the Government's oppressive policy in the interest of national unity. Pastors of all branches of the church have been drafted into service as chaplains and the difficulties of the home congregations have been correspondingly increased.

Martin Niemoeller still continued in confinement in 1939. The statement widely made that he sought release from captivity by offering to serve as a volunteer in submarine service, proves to be without foundation. The fact is that Niemoeller is a reserve officer in the German navy and told his wife that if called up he should feel it his duty to serve. The German Government, however, evidently concluded that the risk of releasing him was too great, and he remains in concentration camp.

The growing attacks upon religion by the rulers of Russia and Germany have caused a corresponding rapprochement between the leaders of the Catholic and Protestant churches. This new spirit of sympathy found impressive illustration in an encyclical of Pius XII in which he called upon all Christians to unite in prayer for their persecuted fellow Christians.

In the non-Roman churches the movement for practical co-operation made notable progress. Landmarks are the World Conference of Madras of Dec. 1938 and the Amsterdam Conference of July 1939.

The Madras Conference, in 1938, held at the initiative of the International Missionary Council, brought together at Madras in India, some 400 delegates drawn in equal numbers from the younger churches in the so-called mission field, and the older churches in the home field. Taking its departure from the findings of the Oxford and Edinburgh Conferences, the Madras Conference considered in some detail the application of these principles to the new problems faced by the churches of Africa and of the Far East. The conference was notable for its strong pronouncement in favour of church unity; a pronouncement rendered more impressive by the presence of large delegations from the churches of China and Japan. The conference also approved the appointment of Dr. William Paton, an officer of the International Missionary Council, as one of the secretaries of the proposed World Council of Churches.

The Amsterdam Conference was held under the joint auspices of the World Alliance for International Friendship Through the Churches and the Provisional Committee of the World Council. It brought together at Amsterdam, in July, some 1,300 delegates of young people's societies from 70 countries, denominational and interdenominational. While the strained conditions under which the conference met made the adoption of formal resolutions inexpedient, the gathering gave an impressive demonstration of the extent to which the young people of different countries feel themselves, in spirit, at one.

The week before the Amsterdam Conference opened, the admin-

istrative committee of the World Council met at Zeist in Holland to decide when and where the first meeting of the proposed World Council should be held. It was reported that 53 churches, including representatives of Orthodox, Old Catholics, Episcopalians, Reformed, Lutherans, Congregationalists, Disciples and Baptists, had already given their approval to the Movement and that its success seemed to be assured. It was therefore decided to call the first meeting for the fall of 1941 and to approve the holding of this meeting in America, if that should prove acceptable to the American churches.

All these developments, in themselves encouraging, have been overshadowed by the coming of war. At no point is the change in the attitude of the churches more apparent than in the spirit in which they have met this new crisis. Where 25 years ago the churches with scarcely an exception approved the action of their Governments in declaring war and confidently expected that the victory of the Allies would promote the moral ends to which they were committed, they now look upon war as the great enemy, involving in its disastrous train victors and vanquished alike. As yet, however, there is no unanimity as to what this new attitude should mean for the responsibility of the churches. There is general agreement at least in all countries where freedom of expression is still allowed, that all peoples share the blame for the causes which have produced the European war. There is equal agreement as to the type of social order which the church should hold up as the ideal, but there is still a difference of opinion as to the way in which this goal is to be reached. A convinced minority believe that war in any form is futile and so take the pacifist's position. The majority believe that there are evils so far-reaching that they must be resisted even at the cost of war and so even though it be with heavy hearts, they lend their support to their Governments in the European conflict. In the United States where sympathy with pacifism is for the moment especially strong, great denominations like the Methodists and Protestant Episcopalians have gone on record in support of the conscientious objector, while in the Presbyterian Church in the U.S.A. (the Northern Presbyterian Church), an amendment removing from the Confession of Faith the phrase "lawful war" was defeated by only a small majority. (See also CHURCH REUNION.) (W. A. BR.)

Religious Denominations: see CHURCH MEMBERSHIP.

Reorganization, Governmental: For regrouping of U.S. offices and bureaus under Federal Security Agency, Federal Works Agency, Federal Loan Agency, etc., see listings under GOVERNMENT DEPARTMENTS AND BUREAUS. See also LEGISLATION, FEDERAL: *Administrative Officers Act*.

Representatives, House of: see CONGRESS, UNITED STATES.

Republican Party. As it entered 1939, the Republican Party, both encouraged and strengthened by gains scored in the elections of Nov. 1938, prepared to play a more active part in national affairs. When the 76th Congress assembled on Jan. 3, 1939, the Republicans held 23 Senate and 169 House seats. Eighteen States had Republican governors—a gain of 11, and in State and local governments the number of Republicans holding elective office had greatly increased. Senator Charles L. McNary of Oregon and Representative Joseph W. Martin, Jr., of Massachusetts, continued, respectively, as Republican Senate and House leaders.

John D. M. Hamilton remained at the helm of the Republican National Committee and Franklyn Waltman, a former newspaper man, continued as its director of publicity. Through its research division, under the direction of Olin Glenn Saxon, professor of economics at Yale, the National Committee prepared factual studies on current issues. These were made available to Repub-

licans in Congress and party workers throughout the country. Representative J. William Ditter of Pennsylvania served as chairman of the Republican Congressional Committee and Senator John G. Townsend, Jr., of Delaware headed the Republican Senatorial Committee.

Preparation for the 1940 campaign was the principal objective of the national organization.

With their numbers nearly doubled, Republicans in Congress showed increased activity. On several occasions, they joined with independent Democrats to defeat or sidetrack important Administration measures. With the help of independent Democrats, Republicans in Congress defeated the Administration's \$3,800,000,000 spend-lend program, forced the enactment of a tax revision measure to relieve business of certain burdensome levies, won a revision of the Social Security Act to "freeze" the payroll taxes at their present levels, and modify plans for a \$47,000,000,000 reserve fund, assisted in passing the Hatch "pure politics" bill to prohibit electioneering by all Federal officeholders, and supported a Congressional investigation of the NLRB.

Despite virtually solid Republican opposition, the Administration won its fight to continue until Jan. 15, 1941, the \$2,000,000,000 Stabilization Fund, and to continue the power of the President to alter the gold content of the dollar. In the Senate, many Republicans voted for the amendment offered by Senator Alva Adams, Democrat of Colorado, to fix the price for newly-mined domestic silver at 77.57 cents an ounce, instead of 64.64 cents.

To help formulate Republican policy, Minority Leader Martin appointed five special study committees. These committees, with their chairmen, were as follows: national defence, Representative James W. Wadsworth, New York; extraordinary powers of the President, Representative Jesse P. Walcott of Michigan; national debt policy, Representative Daniel A. Reed of New York; agriculture, Representative Clifford R. Hope, Kansas; and reciprocal trade agreements, Representative Allen Treadway, Massachusetts.

During the regular session, Republicans in Congress made it plain that they would oppose American involvement in European power politics. Following the outbreak of the European war, the President, in September called Congress into extra session to revise the neutrality law and repeal the arms embargo. Though several leading Republicans, including Senators Taft, Austin, Bridges and Representative James W. Wadsworth of New York supported the Administration's neutrality proposals, a majority of Republicans in both Houses voted to retain the arms ban.

Scattered State and local elections on November 7 seemed to indicate that the Republican Party had lost no ground in favour with the voters since the national elections of 1938. In Philadelphia, the Republican candidate for mayor, Robert E. Lamberton, defeated his Democratic opponent, Robert C. White. In Cleveland, Mayor Harold H. Burton, Republican, was elected for his third consecutive term. Commenting on the elections, Chairman Hamilton, in a statement issued on November 8, said:—"With only a few exceptions, Republicans maintained or increased their strength compared with a year ago, notably in Pennsylvania, New Jersey and other Eastern States. . . . The failure of the New Deal to restore the country to economic recovery was made the issue in a number of local contests where the Republicans won." Since the 1936 campaign, Hamilton revealed, the party debt had been reduced from \$1,200,000 to approximately \$655,000.

The Republican National Convention in a presidential election is usually held the second week in June, the Democrats meeting about two weeks later. A proposal for a later meeting date in 1940, either in June or August, had the support of many leaders. The Executive Committee had no authority to fix the convention date. This was to be done by the full Committee when it met early in 1940. (See also ELECTIONS; UNITED STATES.) (O. MCK.)

Resins, Synthetic: see CHEMISTRY, APPLIED; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY.

Retail Sales. The sales for 1939 of all types of United States retail stores will show an estimated increase of approximately 6½% over 1938. The fiscal year of most retail stores ends January 31 and as a consequence the percentage of increase in January sales must be estimated. The largest sales increases in dollar volume were shown by the two major combination retail-mail order companies. During the first six months in 1939 the increase in retail sales was nominal. Beginning with July, however, the percentage of increase became larger and each subsequent month continued to show relatively larger increases than were shown during the first six months in 1939.

The increase in 1939 was not only in dollar volume but also in the number of transactions, since the estimated increase in number of unit sales made by retail stores in 1939 was approximately 4% greater than in 1938.

There was also a slight increase in the dollar value of each transaction. This was not due primarily to an increase in retail prices but rather to the increase in consumer buying power which permitted the purchase of more units of merchandise in the medium and upper brackets. Save for a brief period of a few weeks after the declaration of the European war, when prices on some commodities rose sharply, there was little if any increase in retail prices generally.

The increase in sales volume in 1939 over 1938 brought a drop in the operating expenses of retailers of about 2% and the average for the year 1939 of operating expenses for department stores and specialty stores will approximate 33% as compared to 35% for the year 1938.

Retailers faced the close of their 1939 fiscal year with their inventories in a satisfactory position. Although the inventories averaged 8% to 10% more in dollar value than they were in 1938, this was not out of line with the expected increases in sales that will probably be obtained in the early months of 1940, since it is expected that the increase in sales in the early period of 1940 over 1939 will range from 5% to 10%.

Based on financial statements issued for the first three quarters, there was a substantial increase in net profit on sales for the year 1939 as compared to 1938. It is estimated that the best managed department and specialty stores and those in more strategic positions obtained a 5% net profit on their retail sales for the fiscal year 1939, whereas in 1938 the net profit of most of the larger stores where profits were shown, was less than 3% on their retail sales.

The control of operating expenses in 1940 will still be a major problem for retailers in view of the higher prevailing wage levels, the tendency to shorter hours, and the prospect of additional taxes. Moreover, retailers will be greatly concerned if there is any substantial advance in consumer commodity prices that may be reflected in higher retail prices, since unless these are nominal and gradual, consumer purchasing power will be inadequate to absorb the increase and thus enable retailers to maintain the expected increase in their sales volume during the early part of 1940. (See also CHAIN STORES; MAIL-ORDER BUSINESS; MARKETING.)

(P. J. R.)

Réunion: see FRENCH COLONIAL EMPIRE.

Revenue Act of 1939: see LEGISLATION, FEDERAL.

Rheumatism: see ARTHRITIS.

Rhode Island, one of the original States of the United States, popularly known as "Little Rhody"; area, 1,248 sq.mi. (smallest of the United States); population accord-

ing to the U.S. census of 1930 was 687,497 and 680,712 in the 1936 State census. Of the latter figure, 525,232 were native white, 144,952 were foreign-born white comprising 30,093 Italians, 33,105 French Canadian, 20,458 English, 13,459 Irish, 6,355 Polish, 5,133 Scottish; 10,528 were Negroes and others. The urban population in 1930 (U.S. census) was 635,429, or 92.4% and in 1936 (State census) was 578,206 or 85%.

The cities are Providence (capital), which (1936) had a pop. of 243,006; Pawtucket, 72,820; Woonsocket, 46,822; Cranston, 44,533; Newport, 29,202; Warwick, 27,072; Central Falls, 23,996.

History.—At the regular 1939 session of the legislature, leading measures passed were: act reorganizing the State departments by revising the reorganization act of 1935; act creating a civil service system and a resolution proposing a civil service amendment to the Constitution; act allowing the mayor of Providence greater appointive power and providing for a charter commission to draft a charter revision proposal for Providence; act appropriating money for investigation of voting frauds; acts creating commissions to study and report upon juvenile and district court legislation, election and caucus laws, direct primary and corrupt practices acts, labour legislation, division of Providence into five senatorial districts; annual appropriation bill reducing State expenditures by more than \$1,000,000; acts levying a tax on cigarettes and all other tobacco products, increasing inheritance tax and increasing tax rates on electric and communications utilities; act exempting from local taxation idle mill and manufacturing property; act creating a board of trustees for State colleges but reserving to the legislature control over the fiscal affairs of the institutions; act permitting group hospitalization; acts permitting certain municipalities to rehabilitate hurricane-damaged beaches; act ceding land to the Federal Government for a naval air base; act changing date for registration of automobiles to April 1; act banning the use of "loss-leaders" in retail trade; resolution proposing a constitutional amendment banning dual office-holding.

The chief officers of the State were: William H. Vanderbilt, governor; James O. McManus, lieutenant-governor; J. Hector Paquin, secretary of State; Louis V. Jackvony, attorney-general; Thomas P. Hazard, general treasurer; Edmund W. Flynn, chief justice of the Supreme Court.

Education.—During 1938–39 there were in the public elementary schools 68,790 pupils and 2,269 teachers; in junior high schools 25,449 pupils and 1,007 teachers and in senior high schools 23,302 pupils and 976 teachers. There were in private and parochial elementary schools, 23,634 pupils; in junior high schools, 4,589 pupils, and in senior high schools 6,033 pupils. Teachers in private and parochial schools numbered 1,252.

Charities and Correction.—During 1939 there were handled by the State department of Social Welfare 6,800 cases of old age assistance, 1,150 cases of aid to dependent children, 150 cases of soldiers' relief, 60 cases of aid to the blind and 8,300 cases of State unemployment relief. Under same department were institutions: mental hospital, 2,773 inmates; infirmary, 820; school for feeble minded, 731; home and school, 206; correctional school for girls, 37; correctional school for boys, 116; soldiers' home, 68; reformatory for men, 117; reformatory for women, 20; prison, 268.

Banking and Finance.—In the State there were 35 banking institutions. Resources of 23 banks under State supervision totalled \$447,915,110, and of 12 banks under Federal supervision, \$111,309,207. Savings deposits in savings banks and trust companies amounted to \$315,690,553, representing 398,664 depositors June 30, 1939. In addition, five loan and investment companies had resources of \$8,730,530; eight building and loan associations, \$37,261,999; 14 credit unions, \$3,108,838.

Agriculture.—In 1935, the farm population was 21,751 in con-

trast with 16,477 in 1930. All land in farms, 307,725 acres; 4,327 farms; value, \$35,237,660. Crop production estimate by acres and quantity, report of Rhode Island department of agriculture and conservation for year 1938, indicated: tame hay, 45,000ac., 58,000 tons; potatoes, 3,900ac., 624,000bu.; apples, 308,000bu.; peaches, 27,000bu.; pears, 11,000bu.; grapes, 220 tons. Livestock, 23,159 dairy cows producing 142,000,000lb. of milk; 320,000 hens (1937) producing 2,910,000 dozen of eggs.

Industry and Business.—The United States census of business for 1935 shows that there were in the State 165,024 employees receiving a payroll of \$181,309,000. Retail business employed 28,881 with a payroll of \$27,671,000. Wholesale employed 6,328; insurance, real estate and finance, 4,976; service, 3,210; hotels, 1,288; mines and quarries, 175; construction, 2,299. Manufacturers employed 112,518 in 1,429 manufacturing establishments with a payroll of \$120,070,000. The census of manufacturers for 1937 listed 1,409 establishments employing 108,031 workers producing goods valued at \$517,196,193, and paying in wages \$112,933,084. More than 50% were employed in the textile industry, there being 309 textile plants employing 57,050 workers, manufacturing goods valued at \$259,603,426. (M. C. Mr.)

Rhodesia. Area 440,656 sq.mi.; comprises two territories in Africa, of the British Empire, *viz.* Southern Rhodesia and Northern Rhodesia. Certain essential statistics are given in the table below. See also BRITISH EMPIRE.

History.—Southern Rhodesia is a self-governing member of the British Commonwealth but supervision over native rights is reserved to the Imperial Government. Northern Rhodesia remains a dependency of the Crown. The Royal Commission on the question of closer union between the Rhodesias and Nyasaland issued its report early in 1939.

The commission recommended closer co-operation between the three territories but left amalgamation of the Rhodesias to be decided in the future after a period of parallel development. It suggested that the union of Northern Rhodesia and Nyasaland might take place at an early date.

A general election for the Southern Rhodesia parliament party was held in April. The United party led by Mr. Huggins, the prime minister, was returned to power with 23 seats out of 30. Labour held 7 seats but neither the Rhodesian nor the Union parties secured seats.

All ministers of the previous Government were re-elected. The prosperity of Southern Rhodesia seems assured. In 1938 gold exports reached the record value of £5,718,000 and export trade in general showed a favourable balance of £2,000,000.

Since the outbreak of war the defences of the country have been strengthened and forces for sending overseas are under training. Over two-thirds of the European male population volunteered for service and conscription was introduced more to prevent depletion of vital industries than for military purposes. Over 100 airmen were sent out of the country for training. The prime minister and the minister for defence visited the United Kingdom to discuss defence and other questions.

The copper industry continues to assure the prosperity of

Northern Rhodesia. At the outbreak of war the price of copper was controlled and the whole of the output taken over by the Government. A five-year plan for the development of social services in Northern Rhodesia provides an expenditure of £1,000,000 on capital works also for an increase in current expenditure.

Expansion of local government through the native authorities continues. More money was set aside for native treasuries from which schools and other social services will be financed. Grants were made from the Colonial Development Fund for the construction of ground facilities for aircraft, also for native hospitals and dispensaries. 1,423,600 acres of land were acquired from the British South Africa Company for the benefit of the native people. (J. L. K.)

Rhodes Scholarships. The American Rhodes Scholarships were suspended by the Rhodes Trustees in Sept. 1939 as a result of the war. The 1939 elections have been postponed and it is not likely that any elections will be held until the end of the war.

There were 96 Rhodes Scholars who would normally have spent the year 1939 at Oxford. Immediately after the opening of hostilities the 1939 Scholars-elect were ordered to remain in the U.S.; the 1937-38 Rhodes scholars in residence in Oxford returned to the United States as soon as accommodations could be obtained after declaration of war. Scholarships in force are only suspended and will be resumed when possible. (F. Av.)

Ribbentrop, Joachim von (1893-), German statesman. The son of a former lieutenant-colonel, descended from a family long connected with the German army, he was born April 30 at Wesel on the Rhine and was educated at the gymnasium at Metz. Later he studied languages for several years at Grenoble and London, then went to Canada in 1910 as an independent merchant. He returned to Germany after the outbreak of the World War and enlisted in a Hussar regiment. Serving on both eastern and western fronts and in Turkey, he was wounded, advanced to lieutenant-colonel, and by the end of the war was attached to the war ministry. After being mustered out of the army he returned to business life as a wine merchant and established an influential import and export firm. He first became identified with the Nazi party as a worker in 1930. In his home in Berlin-Dahlem were held the important meetings that preceded Hitler's appointment as Chancellor of the Reich Jan. 30, 1933. Until May 1935 Ribbentrop was a commissioner of the Reich on disarmament problems, then he was appointed ambassador-at-large. From 1936 to 1938 he was ambassador to Great Britain, and on Feb. 4, 1938, five weeks before Hitler marched into Austria, he was appointed foreign minister. Ribbentrop, who had concluded the anti-Comintern pact in 1936, also negotiated its antithesis, the Nazi-Soviet pact of non-aggression in 1939, and personally went to Moscow to sign it August 24. He played a prominent role in the negotiations with Britain prior to the beginning of the European war, and thereafter was Hitler's intermediary in Moscow, signing for Germany the Nazi-Soviet partition agreement of September 29.

Rice. World production of rice in 1939 was generally below 1938. The 1939 Chinese crop was predicted in consular reports 5 to 10% smaller.

The Chinese crop of 1938 was 2,811,000,000 bushels. Burma crop would be 10 to

Territory and Area in sq. mi.	Principal Products in 1938 (in metric tons).	Imports and Exports 1938 (in thousand £).	Road and Rail 1938.	Revenue and Expenditure (in thousand £).	Education: Elementary and Secondary 1938.
NORTHERN RHODESIA 290,323	copper, 213,031 gold, 31.6 kg.	imp. 5,224 exp. 10,135	All rds. 5,924 mi. rly. 622 mi.	(est. 1939) rev. 1,405 exp. 1,265	Eurpn. schls., 18, schls., 1,320; African schls., 431, schls., 35,570.
SOUTHERN RHODESIA 150,333	coal, 1,043,615 gold, 25,321 kg.	imp. 0,750 exp. 10,574	Main rds. 1,621 mi. rly. 1,357 mi.	(1938-39) rev. 3,515 exp. 3,585	Eurpn. schls., 111, schls., 10,762; Asiatic and coloured schls., 12, schls., 11,462; native (1937) schls., 1,283, schls., 108,995.

15% below normal due to floods (1939). The 1938 Burma crop was 400,400,000 bu. Drought was reported to have cut the 1939 Chosen crop 25 to 35%; the 1938 crop was 220,000,000 bushels. The 1939 Japanese crop was estimated Sept. 20 as 588,000,000 bu. compared to 599,000,000 bu. in 1938. The 1939 Taiwan crop was 36,662,000 bu. compared to 44,433,000 bu. (1938). Italy, the largest surplus-rice producing country of Europe, had a bumper 1939 crop, 40,800,000 bu. compared to 40,090,000 bu. in 1938. The price of the Italian crop was fixed to start at \$1.02 a bushel and finish at \$1.10.

Rice Production in the United States
(As reported Nov. 1, 1939, by Department of Agriculture)

	1939 bu.	1938 bu.	Average 1928-37 bu.
Total U.S.	52,204,000	52,303,000	43,387,000
Louisiana	20,812,000	20,748,000	18,128,000
Texas	13,932,000	13,005,000	9,215,000
Arkansas	9,180,000	9,450,000	8,178,000
California	8,280,000	9,100,000	7,827,000

Exports from the United States during the rice-marketing year ending July 31, 1939, were the highest in ten years, 326,122,000 lb. in terms of cleaned rice. Of this, Cuba, the largest customer, took 203,261,000 pounds.

(S. O. R.)

Richtmyer, Floyd Karker

(1881-1939), U.S. physicist, was born at Cobleskill, N.Y. on October 12 and received his education at Cornell university, where he taught from 1906 until his death and was dean of the graduate school after 1931. He was internationally recognized by men of science for his study of X-rays and for his development of the laws of X-ray absorption in matter. He was chairman of the division of physical sciences of the National Research council (1930-35), president of the American Physical society (1936), of the Optical Society of America (1920), and of the American Association of Physics Teachers (1937-39). Among his honours was the Levy medal (1929) of the Franklin institute, Philadelphia. He died November 7 at Ithaca, New York.

Rinfret, Fernand

(1883-1939), Canadian statesman, was born February 28 at Montreal. In 1907 he became parliamentary correspondent for *Le Canada*, and he was editor of this French-Canadian journal from 1909 until 1926. He was first elected to the House of Commons in 1920 and was re-elected five times. Prime Minister Mackenzie King appointed him secretary of State in 1926, and he served in this position until 1930. From 1932 to 1934 he was mayor of Montreal. King again appointed him to his cabinet in 1935 as secretary of State, in which post he continued until his death at Los Angeles, Calif., on July 12.

Rio de Oro: see SPANISH COLONIAL EMPIRE.

Rio Muni: see SPANISH COLONIAL EMPIRE.

Rivers and Harbours.

Improvements of rivers, harbours, and other waterways of the United States for navigation are prosecuted by the Corps of Engineers, U.S. Army, under the direction of the secretary of War and the supervision of the chief of engineers, in accordance with plans authorized by the Congress. Approximately 1,000 river and harbour projects were in force on June 30, 1939. New work was undertaken on 177 projects and 48 were completed during 1939. Active maintenance operations were under way at 296 localities. Total expenditures during the fiscal year were \$117,700,000, of which \$77,600,000 was for new work. The total net water-borne commerce during 1938 over federally-improved waterways and

harbours of the United States, after eliminating all known duplications, was 466,900,000 short tons valued at \$17,019,000,000.

The principal items of new work in progress during 1939 on rivers and harbours, exclusive of that on canals and inland waterways, include construction of a 40-ft. channel at Boston harbour; the enlargement of the Hudson River channel to a 48-ft. depth between West 40th and West 54th streets; the deepening of Bay-side-Gedney channel to 35ft.; the deepening of Bay Ridge channel to 40ft.; the improvement of the New York-New Jersey channels to provide a controlling depth of 35ft.; the deepening of Buffalo bayou at Houston, Tex., to 34ft.; the widening of Cuyahoga river at Cleveland harbour; and the general enlargement of channels at Fairport, Ohio, and Buffalo, New York.

Additional dikes for contraction works and dredging for channel correction at the Southwest pass, mouth of the Mississippi river, were under way. On the North Pacific coast the south jetty at the mouth of the Umpqua river was extended, a 26-ft. channel at the mouth dredged and a 22-ft. channel to Reedsport started; an auxiliary jetty was under construction at the mouth of the Columbia river; the 15-ft. deep, 300-ft. wide channel on the Columbia river between Vancouver and Bonneville was started; fish lock machinery was installed at Bonneville dam; and reconstruction of the Grays harbour jetties continued.

Major works completed include a 40-ft. channel in the Hudson river at New York for full river width from Ellis island to 59th street; a 20-ft. channel along the New Jersey pierhead line from Kill Van Kull to Anchorage channel; construction of a 35-ft. deep turning basin at Hollywood harbour, Fla.; the widening and deepening of the turning basin at Miami; a 25-ft. channel in the Cape Fear river to Navassa, N.C.; channel deepening at Bridgeport, Conn.; deepening of Egmont Relocation channel at Tampa, Fla., to 32ft.; construction of a 32-ft. channel at Mobile, Ala.; the Galveston, Tex., project providing 34ft. to Bolivar Roads and thence 36ft. to deep water in the Gulf of Mexico; the outer harbour, channel and turning basin at Lorain, Ohio; the harbour at Conneaut, Ohio; a sand barrier at Crescent City, Calif.; the widening of the 30-ft. channel of the San Joaquin river below Stockton, Calif., and the upper settling basin near that city; a 24-ft. deep, 200-ft. wide channel at Rainier, Ore.; and a 40-ft. outer harbour turning basin at Los Angeles, California. (See also CANALS AND INLAND WATERWAYS; FLOODS AND FLOOD CONTROL; WATER POWER.)

(J. L. S.)

British Isles.—The steady progress in the development of accommodation for shipping which has characterized British port policy during recent years was abruptly arrested in the early autumn of 1939 by the outbreak of hostilities with Germany, and for the last four months of the year there was a practical cessation of all activities which were not essential to the prosecution of the war, though certain works which were well advanced towards completion were allowed to be continued. The interruption, indeed, was actually earlier than the outbreak of war, because for months beforehand, right back, in fact, to the beginning of the year, the shadow of the impending disaster hung over the country and port authorities were reluctant to undertake schemes, the success of which would be dubious in view of the rapid approach of conditions likely to affect maritime commerce adversely to a very marked degree. Moreover, they were called upon to expend considerable sums of money on protective works and to train their staffs to deal with emergency conditions. The Port of London Authority, for example, spent £250,000 in constructing 3½ mi. of trenches within the dock area for the protection of 30,000 workers from blast and splinters in air attack. Rescue, fire prevention and gas decontamination services were also organized, involving much time and attention. Notwithstanding this, the Authority managed to carry on their program of improvements on which

they embarked some three years ago and certain works were completed in the early part of 1939, including two new warehouses for plywood at the Surrey docks. Considerable progress was also made in the modernization of the Royal Victoria dock, a total length of over 3,000 lin.ft. of deep water quays being rendered available, while substantial progress was made in the erection of warehouses. Improved accommodation has also been provided at the India and Millwall docks. As matters of outstanding importance at other British ports, there may be mentioned the new branch dock, roac. in area, at the Royal Edward dock, Avonmouth, which was begun in Feb. 1939 and was (Jan. 1, 1940) well in hand. At Cardiff, a new general cargo quay, 1,000ft. in length, was completed and put into commission. The year 1939 was notable at this port by reason of the commemoration of the centenary of the opening of the first dock—the Bute West dock. At Newcastle, the Tyne Improvement Commission were building, at a cost of £221,000, a new quay in the Tyne dock. At Leith, the construction of new breakwaters for the extension of the harbour was progressing steadily, the Eastern breakwater being nearly completed, while about one-third of the Western breakwater was formed. On the other side of the Irish sea, much progress was made at Dublin with the construction of two new wharves for tankers, and the extension of the Alexandra quay for a length of 1,400ft. was commenced.

France.—In France, the same general considerations obtained as in Great Britain, but certain works of importance were in hand; notably at Dunkirk, where a new entrance lock, 984ft. long, was completed; at Calais, where a new maritime station was inaugurated, and at Marseilles where the reconstruction and extension of the Eastern basins was well advanced.

By a decree dated March 20, 1939, the ports of Havre and Bordeaux ceased to be autonomous in administration.

Holland.—In Holland, a new oil basin, with an area of 35ac., was in course of formation at Pernis, within the port area of Rotterdam, where a new wharf and cargo shed were recently completed.

Denmark.—In Denmark, the new port of Fredericia was opened in July 1939. An important program of improvements was foreshadowed for the port of Copenhagen.

Spain.—Following the devastation produced during the civil war, the National Government in Spain is proceeding with the repair and modernization of a considerable number of Spanish ports, including those in the Balearic isles.

Other notable events in Europe include the inauguration of works for a new harbour at Tashaul in Rumania, as a relief port to Constanta.

Africa.—In Egypt, the harbour of Alexandria is to be improved. At Capetown, the new outer breakwater is practically completed for its full length of 7,000ft., while over 2,000 lin.ft. of quay wall was constructed and a considerable amount of dredging and reclamation work carried out. Four berths for shipping were brought into commission in the new basin, which ultimately will be able to accommodate 17 ocean-going vessels.

Australia.—During the summer of 1939 a contract was placed for the construction of the new Appleton dock adjacent to the Victoria dock at Melbourne. It will provide berthage for six large ships. (B. Cu.)

A NEW FLOOD WALL on the Ohio river completed in 1939 protects the business district of Huntington, West Virginia

Roads and Highways. Throughout the world there was great activity in the first half of 1939 in modernizing old road systems to make them suitable for present traffic and the world network of highways continued to grow and extend into regions formerly inaccessible. Road building came to a sudden stop in most European countries with the beginning of war in September. Highway improvement has made possible a continuation of the phenomenal increase in the use of motor vehicles. At the beginning of 1939, 43,819,929 motor vehicles were in operation, an increase of 1.7% over the previous year and an increase of 36.8% over the preceding 10 years. The United States holds first place in number of vehicles with about 30,000,000 followed by the United Kingdom with 2,611,000, France in third place with 2,251,000, Germany next with 1,816,000, Canada in fifth position with 1,375,000; Australia follows with 758,000. Countries of English speaking people all rank high in number of motor vehicles and mileage of improved highways but excellent highway transportation facilities are now being provided in many countries that were considered backward only a few years ago.

In the older, more densely populated countries with old established highway systems, the greater part of the work done consisted of modernizing main highways to make them suitable for the present speed and volume of traffic. There was also a more definite realization of the need for special motor roads built according to the highest standards to accommodate the large volumes of traffic in metropolitan and congested areas. Highways of this type are not new. There are numerous examples of high-standard multiple-lane highways and Germany has been engaged in

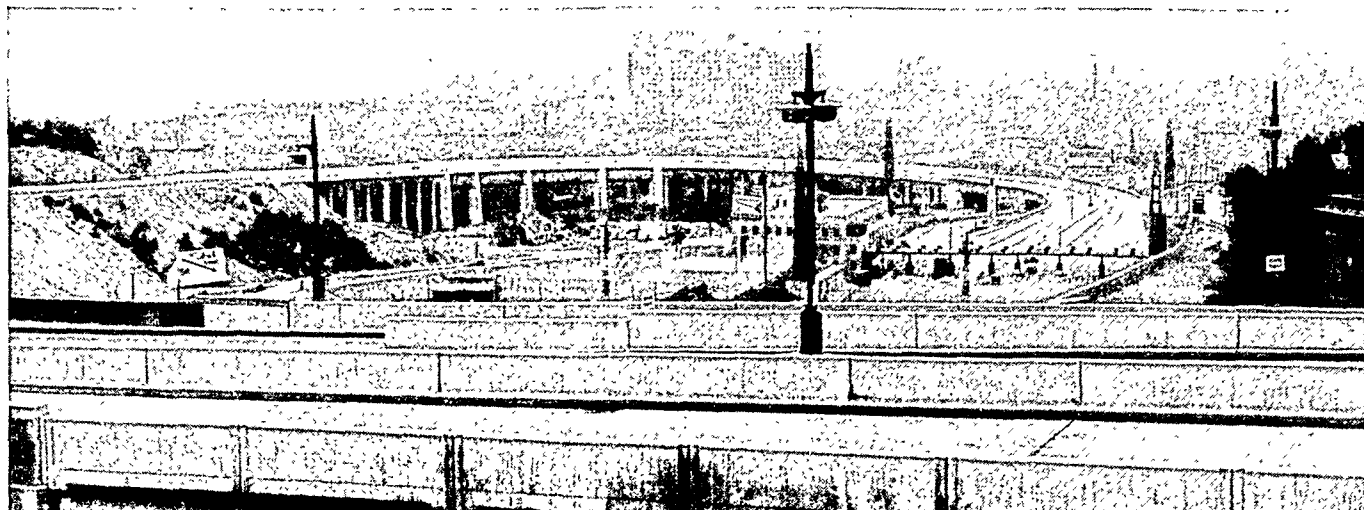
Mileage of World Highways and Condition of Improvement*

	Unimproved	Improved	Not Specified	Total
North and South America, exclusive of United States . .	649,636	235,180	95,899	980,715
United States	1,965,000	1,100,000	.....	3,065,000
Europe, exclusive of United Kingdom	128,614	674,679	2,420,695	3,223,988
United Kingdom . . . . .	.....	176,022	2,882	178,904
Africa	166,043	189,666	82,289	437,998
Asia	96,822	321,198	720,217	1,138,237
Australia, New Zealand and Oceania	295,559	274,692	8,679	578,930
	3,301,674	2,971,437	3,330,661	9,603,772

*Information collected by U. S. Department of Commerce.

building a national system of such highways. In the first half of 1939 more highways of this type were being built or planned, and in England, France and the United States there has been general discussion of the necessity of planning and making provision for future needs for heavy-traffic, high-speed arteries. Projects of this type are the ones that attract the greatest public notice





SIX-LANE EXPRESS HIGHWAY from Lincoln tunnel, New York city, opened June 30, 1939

but in nearly every country with an old road system attention has been centred most largely on modernization of the old roads.

Since the beginning of war in Europe in Sept. 1939 very little news concerning highways has been reported. Such information as has become available indicates that major highway work has been stopped in the countries at war. In these countries highways are playing an important part in the movement of troops and supplies, and in the production of munitions, machines and other war materials. Motor vehicles have been conscripted, gasoline is being rationed and it is evident that highway transport facilities are to be devoted entirely to war purposes and supplying the essential needs of civilian populations.

United States.—In the United States more than a billion dollars has been expended annually on highways since 1923 and in each of the last three years between 1½ and 2 billion dollars has been expended.

In the highway program administered by the Public Roads Administration of the Federal Works Agency, largely in co-operation with the States, 13,482mi. of highway were improved in the fiscal year 1939 and 382 highway-railroad crossings were eliminated. The United States leads all other countries in the progress made in elimination of grade crossings.

In April 1939 the Federal Government completed the first comprehensive study ever made of the national highway situation, taking into account conditions on city streets, main rural highways and on secondary or farm-to-market roads. The study revealed that express routes passing directly through the centres of our largest cities are urgently needed to relieve serious traffic congestion. Difficulties of acquisition and the high cost of necessary rights-of-way are the most serious obstacles hindering provision of the needed improvements. The report which was sent to Congress by the President recommended: The construction of a system of interregional highways complete with connections through and around cities; modernization of the Federal-aid highway system; elimination of hazards at railroad grade crossings; improvement of secondary roads; and the creation of a Federal Land Authority to facilitate the acquirement of lands needed for public purposes.

The report states that a system of transcontinental toll is not economically feasible and would not solve any considerable part of the highway problems.

Canada.—Highway development in the provinces of Canada is following closely along the lines of development in areas of the United States with comparable population density. Ontario, the province most advanced in road building, has over 5,000mi. of sur-

facied road. This province has completed a considerable mileage of special "motorways." Vast northern areas of Canada are being opened by roads being constructed in other provinces. Roads now under construction in the Canadian Rockies will make accessible some of the world's outstanding scenic wonders.

Inter-American Highway.—Nearly half of the projected Inter-American highway is now surfaced. This highway, 3,267mi. in length, extends from the United States through Mexico, Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica to Panama. At present 1,123mi. are paved, an additional 669mi. may be traversed at all seasons, 653mi. are usable in dry weather and 822mi. are only trails.

Recent highway construction along the west coast of South America and in Argentina leaves only a few major obstacles in the way of a Pan-American highway linking together all countries of the two American continents.

Mexico continues its rapid progress in the creation of a national highway system. During 1938, 641mi. of highway were constructed of which 435mi. were surfaced.

Argentina.—This country is making excellent progress in carrying on the ambitious highway program initiated in 1933 by the National Highway Bureau. Since then 23,000mi. of road have been improved and in 1937 and 1938 the rate has been at about 620mi. a year. Both a national highway system and secondary or feeder roads are being built. Many miles of low-cost road of types similar to those used in the United States are being built on the secondary system. Specific authorizations of funds have recently been made for improvement of international routes. Transit over the Andes to Chile has been blocked for about seven months of the year on account of snow.

A joint commission of engineers representing the Argentine and Chile has recommended plans to enlarge a railroad tunnel so as to make highway communication between the countries possible for nine months of the year.

Brazil.—The great area of Brazil presents a difficult problem to its road builders. Of the 120,000mi. of road reported, about 20,000mi. have been improved. Brazilian authorities are planning a network of highways connecting State capitals but as yet national funds have been made available only in small amounts. The State of Rio Grande do Sul is particularly active in road work and is planning the construction of about 450mi. of entirely new road.

United Kingdom.—Highways of the United Kingdom are practically all surfaced. Authorities are now engaged in modernizing the old roads, a problem more difficult than in any other country because of the dense population and the many roads located hundreds of years ago that are still in use. During 1939 many major improvements were made both in the London area and adjacent to large cities throughout the Kingdom. When the outbreak of war put an end to major highway activity the Ministry of Transport had begun rebuilding the Great North road from London to Edinburgh as a fine modern road designed according to the latest standards and departing from the Roman road in many places. It was planned to spend £2,000,000 on 26 projects, 14 of which had been started.

Europe.—Every European country made substantial progress in road development during the first eight months of 1939. The war-torn roads of Spain were being repaired and it was planned to spend \$92,000,000 for work already begun and \$245,000,000 for supplementary work. The supplementary work will include 388mi. of new national highway, 1,242mi. of regional highway, and 6,213mi. of local road.

Germany continued the rapid improvement of the system of Reichsautobahnen begun in 1933. Work was pushed on both the original system and on extensions into territory brought under German control. These highways

have broad surfaces with separated traffic lanes, widely spaced entrances, controlled roadsides, and separated grades at crossings and are designed throughout for large volumes of fast-moving traffic. On July 1, 1939, 3,077km. had been completed, an increase of 713km. over the preceding year, and 2,095km. were under construction.

In the summer of 1939 Sweden was planning the immediate construction of its first express highway from Stockholm to Göteborg. At the same time Poland was engaged in surfacing 1,600km. of highway. This country had only one paved road to its borders, a road from Warsaw to the German boundary near Katowice. Since 1922 Italy has improved about 1,500km. of entirely new State roads and 150km. are now under construction or planned for immediate construction. An intensive program of road construction was begun in Albania immediately after the Italian occupation. More than 10,000 workers are reconditioning old Roman roads and building new roads.

France has an excellent system of highways as a result of more than a century of competent technical direction. In the past year work has been done in modernizing portions of the system, particularly in the region of Paris.

The projected highway from eastern Europe to Istanbul, Turkey, approaches nearer to completion each year. Travel has been possible from France, Germany and Belgium to near the border of Yugoslavia and almost the entire route through Yugoslavia has been improved. Much work has been done in Bulgaria and it is reported that the 256km. section in Turkey from the Bulgarian border to Istanbul will be completed in 1940.

Africa.—Some road building has been done in every country of Africa and this continent is no longer one with an interior that can be reached only over trails. It is now possible to travel by automobile from the Mediterranean through French, Belgian and English territory to Cape Town. Some sections of the road are rough and the route is to be recommended only to experienced travellers. The outstanding highway work in Africa is being done by the Italian Government in Abyssinia and by the Union of South Africa. Important centres in Abyssinia, Eritrea and Italian Somaliland are being connected by a system of nine main roads. In little more than two years 2,100mi. of surfaced roads have been built.

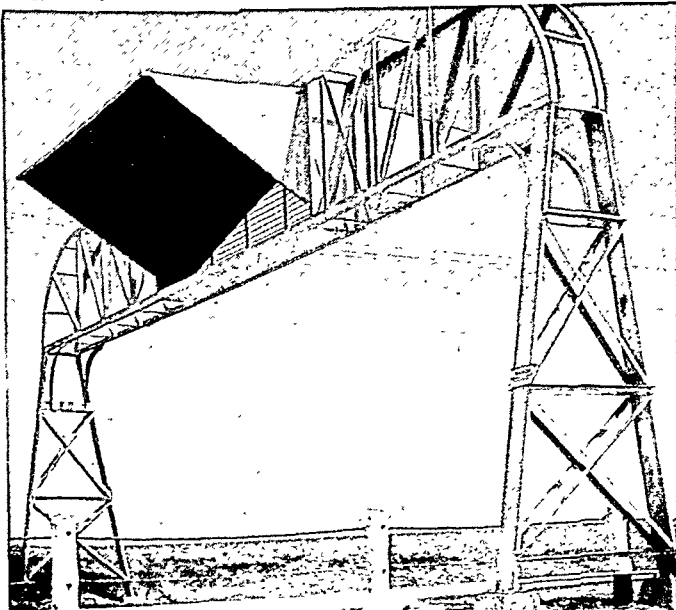
The cost of transporting goods 780mi. from Massawa to Addis Ababa is only one-fifth of what it was in 1936. The Union of South Africa made good progress in the fourth year of its program of constructing 5,400mi. of surfaced road. Since the beginning of war in Europe work has been speeded up on certain of the national roads as a defence measure.

Australia.—For several years road work in Australia has gone forward as a continuing program directed by State authorities. In 1937 a policy of Federal aid to the States was initiated, supported by funds derived from imposts on imported gasoline and that refined in Australia.

Roads connecting the principal cities have already been completed and feeder roads are being extended into the less thickly settled sections.

China.—Before the beginning of the present conflict in China that country was outstanding in its effort to overcome lack of communication through construction of highways. While there has been great destruction of highways in eastern China as a result of military operations, road construction has progressed rapidly in western China. Highways have been built to French Indo-China, Burma and the Soviet Union to establish communications from which China was cut off by Japan's occupation of its ports. Chinese authorities report that construction has been at a rate of 20mi. a day during the past two years. The present war-time capital is rapidly being connected by highway with all provinces under Chinese control. An outstanding achievement is the construction of the Yunnan-Burma highway, about 610mi. in length. Additional work is yet to be done but the

THE "TRAFFICSCOPE," a combination of prisms which gives a motorist unobstructed vision of the other side of a hill, was first tested in 1939 near Harrisburg, Pennsylvania



highway is already in use and a bus line has been established on it.

(See also INDUSTRIAL RESEARCH; MOTOR TRANSPORTATION; MOTOR VEHICLES; TOWN AND CITY PLANNING; TRAFFIC ACCIDENTS.)

(T. H. MacD.)

Robinson-Patman Act: see CHAIN STORES.

Rockefeller Foundation was chartered in 1913 for the permanent purpose of "promoting the well-being of mankind throughout the world." Its present program is concerned with certain definite problems in medical, natural, and social sciences, the humanities, and public health. In the field of medicine its interest is centred in nervous and mental diseases, and its contributions are chiefly for the furtherance of research and teaching in psychiatry and allied subjects. Its program in the natural sciences is concerned with experimental biology. In the social sciences it has three spheres of special interest: international relations, social security, and public administration. The program in the humanities centres around the techniques by which cultural levels of contemporary society are being influenced—such as museums, the radio, drama, and libraries—and the promotion of better international understanding through cultural interchanges. The program in public health includes research on a number of selected diseases; demonstrations in the control of some of these diseases in their environments; co-operation with Governments in services of central or local health departments; and the development of public health education. During 1939 the Foundation appropriated approximately \$9,400,000 for work in its various fields of interest. The chairman of the board of trustees is John D. Rockefeller, Jr.; the president, Raymond B. Fosdick; and the secretary, Norma S. Thompson.

General Education Board was incorporated by an act of Congress in 1903, with the stated object of "promoting education within the United States of America without distinction of race, sex, or creed." Its present program is restricted largely to three types of work: (1) the support of research and experimentation in relation to the problems presented in the field of general education, i.e., the secondary school through the junior college level; (2) the continuance of the existing program in the Southern States; and (3) a program, now coming to a close, in child growth and development. During the year 1939 appropriations approximating \$3,814,000 were made by the board. The chairman of the board of trustees is Ernest M. Hopkins; the president, Raymond B. Fosdick; and the secretary, William W. Brierley. (H. B. V. W.)

Rogers, James Harvey (1886–1939), U.S. economist, was born at Society Hill, S.C. on September 25 and was educated at the University of South Carolina and at Yale, where he received his doctor's degree in 1916. In the meantime he had pursued graduate study for a year at the University of Geneva in Switzerland. From 1916 to 1920 and from 1923 to 1930 he taught economics at the University of Missouri; he also taught for three years at Cornell university and in 1930 he joined the faculty of Yale university as professor of political economy. He was acknowledged by this time to be one of the nation's leading economists. Not long after 1929 he advocated inflation as an economic remedy, and in *America Weighs Her Gold* (1931) he pointed out the disadvantages of a blind adherence to the gold standard. In 1933 he became one of the original members of President Roosevelt's "brain trust" and with Prof. George F. Warren outlined the monetary program which led to devaluation of the dollar in Jan. 1934.

He was killed August 13 with 13 others when a "baby clipper" plane plunged into the harbour at Rio de Janeiro.

Roman Catholic Church.

Sorrow spread through the universal church when the 82-year-old pontiff, Pius XI, died on February 10, 1939. At the call of the papal chamberlain, Eugenio Cardinal Pacelli, secretary of State, 62 cardinal electors assembled in the Vatican. The Conclave solemnly opened on March 1. On the next day, after the third ballot, Cardinal Pacelli was proclaimed sovereign pontiff. He took the name of Pius XII and was solemnly crowned on March 12. He became the 261st successor of St. Peter as vicar of Christ on earth.

Population.—It is estimated that one out of every seven persons in the world is a Catholic. Exact figures are not available, but it is known that the Catholic world population is in excess of 375,475,000. The largest proportion is located in continental Europe.

In the English-speaking lands, the United States leads according to revised figures of the Official Catholic Directory with 21,406,507, an increase of 239,827 over 1938. Latest estimates place the number of Catholics: in England and Wales at 2,406,419, an increase of 31,223; in Scotland, at 614,449; in Ireland, at 3,013,701; in Canada, at 4,771,000; in Australia, at 1,258,112; in New Zealand, at 193,725.

Roman Curia.—Pius XII selected Luigi Cardinal Maglione as his secretary of State. In December, he named Lorenzo Cardinal Lauri as papal chamberlain. Through the year, he strengthened ecclesiastical procedure by several other notable appointments.

The government of the universal church is centralized at the Vatican. Twelve Sacred Congregations, presided over by cardinals, have executive and legislative powers; three Tribunals exercise judicial functions; five Offices transact the ordinary business. The reports and decisions of these Congregations and Tribunals are published in the *Acta Apostolicae Sedis*.

Outside of the activities of the secretariat of State, treated later under *Spiritual and Temporal Relations*, popular interest attaches each year to the decisions of the Tribunal of the Sacred Rota. According to the latest report, 97 cases were presented to the judges; of these, 65 were matrimonial. The decree of nullity was pronounced on 19, the marriage was held to be valid in 46 cases. Twenty-five petitions sought annulment because of lack of consent; only three decrees of nullity were granted for this reason. Of general interest, likewise, are the decisions of the Congregation of the Holy Office in regard to the Index of Forbidden Books. Three titles were added during the year: d'Annunzio's *Solus ad Solam*, and Ubaldi's *L'Acesi Mistica* and *La Grande Sintesi*.

A notable decree was issued by the Sacred Penitentiary on July 22, to the effect that a plenary indulgence may be imparted over the radio.

Ecclesiastical Jurisdictions.—The number of cardinals, traditionally held at 70, declined from 62 to 57 by the end of 1939. Cardinal Pacelli was elected pope, and death visited Cardinals Sbaretta, Mariani, Dolci and Mundelein. No new cardinals were created.

Throughout the world the church is divided into 1,702 jurisdictions. These are classified as 14 patriarchates, 255 archdioceses, 937 dioceses, 292 vicariates apostolic, 135 prefectures apostolic, 50 abbasies and 19 mission prelaties.

Two jurisdictions were erected in the United States. The area comprising the District of Columbia, formerly a part of the archdiocese of Baltimore, Md., was designated as the archdiocese of Washington. Though holding rank as an archdiocese, it will be governed by the archbishop of Baltimore. Gallup, N.M., was constituted a diocese, thus raising the total of American Sees to 117. Two of these, Boston, Mass., and Philadelphia, Pa., are governed, respectively, by Cardinals O'Connell and Dougherty.

Among the notable appointments of the year were: Most Rev. Francis J. Spellman as archbishop of New York, N.Y., and bishop ordinary for the army and navy; Most Rev. Samuel A. Stritch, in succession to Cardinal Mundelein, as archbishop of Chicago, Ill.; Most Rev. Moses E. Kiley, as archbishop of Milwaukee, Wis.; Most Rev. Joseph Schrembs, bishop of Cleveland, O., was given the rank of archbishop; Most Rev. Edwin V. O'Hara was transferred from Great Falls, Mont., to Kansas City, Mo.; Most Rev. William O. Brady was consecrated bishop of Sioux Falls, S.Dak.; Most Rev. William J. Condon, of Great Falls, Montana.

In England and Wales, there are four archbishoprics, of which Westminster is cardinalitial, and 14 bishoprics. In Scotland, two archbishoprics and four bishoprics. Ireland has four archdioceses, including the cardinalitial see of Armagh, and 25 dioceses. Canada numbers 12 archdioceses, with Quebec cardinalitial, 29 dioceses, 7 vicariates. Australia is divided into 5 archdioceses, 17 dioceses, 1 vicariate, 1 abbacy; and New Zealand into 1 archdiocese, 3 dioceses.

Spiritual and Temporal Relations.—The Holy See, in the person of the sovereign pontiff, holds spiritual power over all the Faithful throughout the world, but also exercises temporal power over the Vatican City State (*q.v.*). In this dual capacity, he exchanges diplomatic representatives with governments and peoples. Thirty-nine nuncios, enjoying full diplomatic rank, are accredited to as many nations. Twenty-three apostolic delegates, having no formal, diplomatic status in the country to which they are commissioned, act as papal representatives. Accredited to the Holy See from recognized governments are 13 ambassadors and 27 ministers and envoys extraordinary. During the year a nuncio was named for Lithuania, the first since 1932. Uruguay exchanged representatives, the first time since 1898. In December, without resuming diplomatic relations which lapsed in 1867, President Roosevelt named Myron C. Taylor as his special representative to Pope Pius XII.

All the spiritual and moral influence of the Holy See was directed toward the preservation of peace before September, and since then, for its return. Pius XII seized every opportunity of a public nature to issue appeals. Through diplomatic channels, he attempted, without success, to promote conferences between the governments, excepting Soviet Russia, engaged in war overtures. In these efforts, the pope stated he would not involve the Holy See in political or territorial controversies.

Pope Pius XII welcomed President Roosevelt's proposal for parallel efforts, and issued a five-point program for adjusting European problems.

The church flourished in the United States, and the gains in membership more than compensated for the losses. The 150th anniversary of the establishment of the American hierarchy was observed. In this connection, under date of November 1, Pius XII issued an encyclical, *Sertum laetitiae* addressed to the American bishops.

In France, Great Britain and the countries of the British Commonwealth, there were new and happy auguries of peaceful relations with Catholicism and the Holy See. The church authorities supported the Governments to the fullest extent in the prosecution of their war aims.

Special regulations and exemptions of a disciplinary nature were put into force.

Accord between the Holy See and Italy was further strengthened. The waning influence of Nazi Germany and a pronounced opposition to Communism brought Italy closer to the spiritual aims of the papacy, as did the parallel efforts made to preserve peace. Further agreements on the Concordat were published in June. The Nationalist Government in Spain solidified its loyalty to the church. Some disagreements were inevitable during the

reconstruction period, as to the relation of the church and State, but these were reliably reported as being adjusted amicably.

Condemnation of the destruction of Poland and deep sympathy for the Polish people subjected to atheistic Sovietism and Nazi paganism, were frequently expressed by the Holy See. On October 7, the Vatican recognized the Polish Government set up in Paris.

In Germany, the struggle between Catholicism and Nazi totalitarianism continued. The drive against Catholic education was intensified. Personal attacks on ministers of religion and on Religious were frequent. Conferences between representatives of Nazi Germany and the Holy See were spoken of in the spring, but later developments nullified any accord.

Catholicism, as all forms of religion, was combatted throughout the Soviets. The godless organizations and propaganda increased in intensity. The Holy See recognized, on many occasions, Communism as the greatest menace to religion and world peace. Some new manifestations of Marxian atheism were observed in Mexico, especially in the school decrees.

Missions.—The European war adversely affected the missionary labours through the reduction of the number of missionaries and the curtailing of funds. The number of Catholics in recognized mission lands increased from 14,330,000 to 21,143,000 in the past ten years. Foreign priests number 10,285; native priests, 6,225; religious brothers, foreign and native, total nearly 7,000; religious sisters, almost equally divided between foreign and native, approximate 36,000. Native bishops or vicars govern 44 ecclesiastical territories. It is estimated that 1,439 periodicals support mission activities; of these, 750 are published in mission countries. (See also VATICAN CITY STATE.) (F. X. T.)

Rome-Berlin Axis: see EUROPEAN WAR; GERMANY; ITALY; STRATEGY OF THE EUROPEAN WAR.

Roosevelt, Franklin Delano (1882—). (See *Encyclopædia Britannica*, vol. 19, p. 535, for an extended biography.) On Jan. 4, 1939, in his annual message to Congress, President Roosevelt stressed the need for stronger national defence and declared that there are many methods "short of war, but stronger and more effective than mere words, of bringing home to aggressor governments the aggregate sentiments of our own people." He observed further that "the probability of attack is mightily decreased by the assurance of an ever-ready defence." In his budget message on January 5, he revealed that the Federal Government faced a deficit of over \$3,300,000,000 for the fiscal year 1940. On January 2, he appointed Frank Murphy attorney-general, and three days later nominated Felix Frankfurter as an associate justice of the Supreme Court. At the Jackson Day dinner in Washington on January 7, he urged that the Democratic Party continue to follow liberal policies.

In a special national defence message on January 12, the President said that "careful examination of the most imperative present needs leads me to recommend the appropriation, with as great speed as possible, of approximately \$525,000,000, of which sum approximately \$210,000,000 would be actually spent before the end of the fiscal year ending June 30, 1940." He proposed that \$450,000,000 be allocated for new needs of the army, \$65,000,000 for new needs of the navy, and \$10,000,000 to train civilian air pilots. He also asked for a \$27,000,000 appropriation to increase the permanent garrison at the Panama Canal Zone, and provide additional housing there. On January 16, he proposed a liberalization of the Social Security Act and three days later recommended legislation to subject the salaries of public employees and income from future issues of public securities to Federal income taxation. On January 20, in letters to Speaker Bankhead and Vice-President Garner, he asked continuation until Jan. 15, 1941, of the \$2,000,-

000,000 stabilization fund, and the power of the Chief Executive to alter the gold content of the dollar.

On March 4, the President addressed a joint session to commemorate the 150th anniversary of the first meeting of Congress, and on March 20, nominated William O. Douglas associate justice of the Supreme Court. On April 14, he made two addresses—one, a Pan American Day address before the governing board of the Pan American Union, the other, at Mount Vernon on the occasion of the 150th anniversary of the message received by George Washington from the first Congress of the United States.

In a letter to the Young Democratic Clubs of America on April 19, he declared that in the campaign "we are now approaching, there is just one agency potent enough to defeat the Democratic Party, and that is the Democratic Party itself." He warned that the Democratic Party "can commit suicide by abandonment of the policies that brought it to power." On April 27, he asked Congress to appropriate \$1,477,000,000 for Federal relief for 1940.

In a statement on March 28, the President advanced a plan for disposing of a substantial part of the 11,000,000 bales of surplus cotton held by the Government. He proposed that \$1.25 a bale be paid to producers who release their loan cotton to the market and that a moderate payment be made on all cotton exported after the plan went into operation. He estimated that the plan would cost from \$75,000,000 to \$105,000,000 during the next 16 months. In a speech before the Retailers National Forum on May 27, he defended Government spending.

On June 8, the President and Mrs. Roosevelt gave a State dinner at the White House to King George VI and Queen Elizabeth.

To stimulate industry and increase employment, the President in a letter to Senator James E. Byrnes of South Carolina on June 21 proposed a new Federal lending program. The plan called for \$3,060,000,000 of self-liquidating loans by Federal agencies over periods ranging from two to seven years. "All can be financed through the issue of guaranteed securities by the government agencies, with good prospect of repayment of both principal and interest through earnings," he said. Of the total, he estimated that \$870,000,000 could be put to work to provide employment for men and machines in various lines of industry during 1940. The Senate approved a "Works Financing Act," but the House refused to consider it before Congress adjourned, Aug. 5.

Though problems of recovery and domestic questions required much of his time, the President, as the year advanced, devoted increasing attention to international affairs. On April 15, he sent cablegrams to Chancellor Adolf Hitler of Germany and Premier Benito Mussolini of Italy, asking assurances from each that their armed forces would not attack or invade their neutral independent neighbours. Provided such assurances were given, the United States would be willing, the President revealed, to enter an international conference to discuss limitation of armaments and international trade problems. "We recognize complex world problems which affect all humanity, but we know that study and discussion of them must be held in an atmosphere of peace," he said. "Such an atmosphere of peace cannot exist if negotiations are overshadowed by the threat of force or by the fear of war."

Despite strong pressure by the Administration, Congress at the first session refused to revise the Neutrality Act by lifting the automatic arms embargo. On July 11 the Senate foreign relations committee, 12 to 11, voted to defer consideration of all neutrality legislation until the next session. The House previously had passed the Bloom bill, embodying some of the Administration's proposals, but retaining a mandatory embargo on exports of arms and ammunition to belligerent States. Though the President urged the advisability of prompt action "in the light of present world conditions," a White House conference of Senate Democratic and Republican leaders agreed to postpone further action, and make

neutrality the first order of business at the next session. In the event of a European war, the President announced that he would immediately call Congress into extra session, in advance of the regular meeting date in 1940.

On August 24, President Roosevelt made an appeal for world peace in messages to Chancellor Hitler, President Moscicki of Poland and King Victor Emmanuel of Italy, and the following day he addressed another peace appeal to Chancellor Hitler. On September 1, he asked the Governments of Great Britain, France, Italy, Germany and Poland to refrain from bombing civilians in the event of war. On September 5, following the declarations of war by Great Britain and France, the President issued two neutrality proclamations, and three days later proclaimed a "limited" state of emergency and ordered increases in the Army, Navy and Marine Corps.

On September 13, he called Congress into extra session to revise the Neutrality Act, fixing September 21 as the date for its convening. Addressing Congress in person, he advocated repeal of the arms embargo and a return to the principles of international law as the best means of preventing involvement of the United States in the European war. After extended debate, Congress repealed the arms embargo and adjourned on November 3, taking action which represented a major victory for the President.

Following the adjournment of Congress, President Roosevelt visited Hyde Park, N.Y., and spent Thanksgiving at Warm Springs, Georgia. On December 1, in a sharply worded statement, he condemned Russia's invasion of Finland and the following day proclaimed a "moral embargo" upon the sale to Russia of United States planes and equipment that might be used in bombing civilians.

On December 23, he dispatched a peace message to Pope Pius XII and announced the appointment of Myron C. Taylor as his personal representative and "peace ambassador" to the Vatican. In his message to the pope, the President referred to the parallel efforts in Rome and Washington to aid in bringing back a just peace.

The President spent Christmas Day at a family gathering at the White House. During the closing days of December, he devoted most of his time to conferences with congressional leaders and to work on his budget and annual messages. (See also UNITED STATES.) (O. McK.)

Rosenwald Fund, The Julius. The Rosenwald Fund differs from other large American foundations in that the trustees are not only permitted to spend capital as well as income at any time but are compelled to expend all its funds within 25 years of the death of its founder, that is, before Jan. 6, 1957. During the 22 years since its establishment in 1917 by Julius Rosenwald, this fund has expended more than fifteen million dollars (\$15,335,534), being all of its income from year to year and about three-fourths of its principal fund. At the close of the past fiscal year, June 30, 1939, the assets of the fund (held chiefly in capital stock of Sears, Roebuck & Co. of Chicago) had a value of approximately \$5,000,000.

The chief program of the fund during its early years was aid in the building of rural public schools for Negroes. The main programs at present are (1) improving the content and quality of rural education in both white and Negro schools in the South; (2) aid in building up four important centres of higher education for Negroes: Howard university in Washington, D.C., Atlanta university in Atlanta, Georgia, Fisk university in Nashville, Tennessee, and Dillard university in New Orleans; (3) efforts in behalf of Negro health; and (4) a series of fellowships for Negroes and for white Southerners.

During the year 1939 the fund expended \$530,202 upon these and related programs.

Ross, James Delmage (1871-1939), U.S. civil engineer, was born November 9 at Chatham, Ont., Canada. In 1903 he was appointed superintendent of the municipal power system in Seattle, Washington. From this position he obtained a leave of absence in 1933 to become advisory engineer on power with the Public Works Administration in Washington. In 1937, Pres. Roosevelt appointed him administrator of the huge Bonneville dam project on the Columbia river. Upon his death at Rochester, Minn., March 14, Pres. Roosevelt paid tribute to him as "one of the greatest Americans of our generation."

Ross, John Dawson (1853-1939), U.S. librarian and authority on Robert Burns, was born at Edinburgh, Scotland on October 23 and was educated at the School of Arts there. He removed to the United States in 1873. In 1894 he organized a book company in New York city and was its manager until 1910. He joined the staff of the New York Public Library in 1920. Ross was the author of many books on the Scotch poet, including *Burnsiana* (1892), *The Memory of Burns* (1899), *The Burns Handbook* (1930), and *The Love Songs of Robert Burns* (1932); also other volumes on Scotch poetry and songs. He died at New York city October 29.

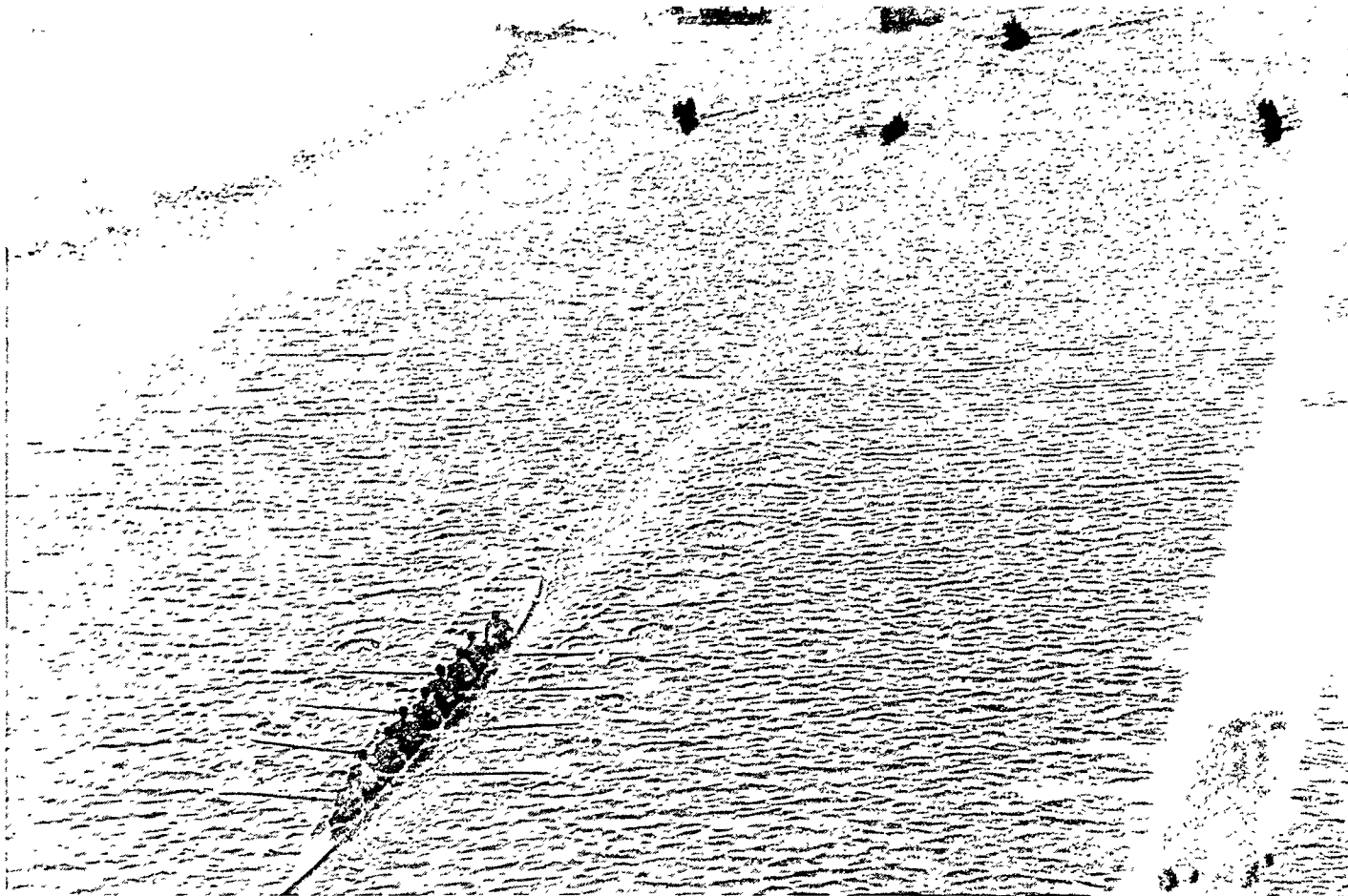
Rowing. The 1939 intercollegiate rowing season opened in the U.S. on April 15 with two regattas. On the Oakland estuary the University of California varsity scored a decisive victory over their ancient rivals from the University of Washington, for the first time since 1932. Losing also to California in the junior varsity event Washington found some solace in the easy victory of their promising freshman crew. On the Harlem river Columbia easily defeated crews from Rutgers and Manhattan.

Harvard easily defeated Rutgers, Massachusetts Institute of Technology (M.I.T.) and Boston university April 22 on the Charles river, making a clean sweep in varsity, junior varsity, freshman and lightweight events. The Naval Academy crews opened their season the same day by defeating Princeton on the Severn river in varsity and junior varsity events but only after close hard races, winning each by about a length.

Navy won a second time on April 29 by defeating Columbia at Annapolis, Md., and were deprived of a clean sweep by the victory of the Columbia freshmen. Having won the mythical intercollegiate championship at Poughkeepsie in 1938 the Navy thus continued their winning streak and loomed as another potential champion. At Ithaca, N.Y., Cornell opened its season by defeating a powerful Syracuse varsity by less than a second in a close and exciting race, M.I.T. trailing by many lengths. A third regatta on this day found Pennsylvania also making its rowing debut on the Schuylkill, winning rather easily over crews from Rutgers and Manhattan.

The eastern rowing season swung into full stride on May 6 with three major regattas. On the Housatonic, Yale in its first trial of the season defeated Pennsylvania and Columbia in the historic Blackwell Cup regatta winning by 1½ lengths and breaking the course record held by Columbia since 1929. On the Severn river Cornell substantiated the promise it had shown the previous Saturday and defeated the powerful Navy crew, removing them from the undefeated class. The margin of victory was about 1½ lengths and although the Navy offered stiff resistance there was no doubt but that Cornell was a really fine crew. On the Charles river Harvard scored a clean sweep in varsity, junior varsity, freshman and lightweight events rowing against Syracuse, Princeton and M.I.T. This was the ninth consecutive victory for the Harvard varsity over a period of two years.

Yale scored a clean sweep over varsity, junior varsity and freshman crews of Syracuse and M.I.T. on the Housatonic river May



IN RECORD TIME, a University of California crew defeated the University of Washington by more than six lengths in their annual regatta Apr. 15, 1939, in Oakland estuary

13. A close varsity race was turned into a walk-away for Yale when an unfortunate mix-up with one of the lane markers forced Syracuse out of the race after rowing nearly even with Yale for a mile. On the same day Princeton also scored a clean sweep over Columbia and Pennsylvania in varsity, junior varsity and freshman races.

The Carnegie Cup regatta at Princeton on May 20 saw Cornell triumph in junior varsity and freshman races in easy fashion over Yale and Princeton. Yale for the second time in 1939 broke a course record, and finished its short distance season undefeated. Keeping its two-year victory record intact Harvard scored its tenth consecutive win, this time at the expense of Navy, Pennsylvania and Columbia on the Charles river.

A fitting climax to the eastern short distance season was scheduled for May 27 on the waters of Lake Cayuga at Ithaca. The undefeated Harvard crew was pitted against Cornell, Pennsylvania and Syracuse. Before the races could be run off a blinding hail and wind storm swept the waters of the lake into a fury. Regardless of the hazardous conditions the races were held and Cornell with a remarkable exhibition of watermanship defeated Harvard by a length with Syracuse and Pennsylvania close behind.

The University of Wisconsin varsity crew, enroute to the Poughkeepsie races, stopped at Lake Onondaga and raced Syracuse on June 9 over a three-mile course, losing by one and one-half lengths.

Seven varsity crews lined up at the start of the annual Poughkeepsie four-mile race in the evening of June 17. The usual rivalry between eastern and western rowing had shown an equal sharing of honours in the two preliminary races.

California won in the record time of 18:12 $\frac{3}{5}$; Washington was second, also breaking the old record (18:19) for the 4-mile course set by Navy in 1938.

The blistering pace set by the powerful western crews over the

last two miles caused the eastern contingent to drop several lengths back, led by Navy with Cornell, Syracuse, Wisconsin and Columbia finishing in the order named.

The college rowing season was brought to a close by the 77th annual Yale-Harvard regatta on the Thames river June 23. Starting at Bartlett's Cove the undefeated but inexperienced Yale crew faced the veteran and powerful Harvard eight and soon after the start Harvard pulled into a slight lead. Rowing at a lower stroke they gradually lengthened their advantage to a maximum of over two lengths at the two-and-a-half-mile mark. Here Yale seemed to improve and soon after the three-mile flags were passed began closing the gap between the two shells. Over the last mile the splendid Harvard crew although being overtaken by Yale was able to hold its lead and crossed the finish line at New London slightly more than a length ahead of Yale and thus completed a clean sweep of the regatta, having won the freshman and junior varsity races in the morning.

Harvard won the annual Joseph Wright Cup race at Cambridge for the championship in the lightweight division of college rowing. Tabor academy was the undisputed champion of preparatory school rowing being undefeated in five races. (E. O. LE.)

Great Britain.—Contrary to all expectations, Cambridge won the University boat race early in April during 1939. Facing an Oxford crew which had been considered much too strong for them, the somewhat lighter Cambridge eight confounded the critics and their opponents by starting with a tremendous rush which gave them a lead of almost a full boat length at the end of the first half-mile and open water at the end of the first mile. Oxford, completely surprised by the unexpected starting speed of the others, never was able to settle to real rowing, struggled hard but was never back in the race. Cambridge, with a comfortable lead, dropped its stroke to 30 and paddled over the course in control all the way. At one point, the winners had almost six lengths of lead, holding four at the finish in face of a late rally by the losers.

The Henley regatta was notable for the dominance of foreign crews. Harvard university won a victory in the Grand Challenge Cup, becoming the second United States, and incidentally Harvard, crew to win this event, the last time in 1914. Turning back London Rowing Club, holders of the Grand, in their first heat, Harvard continued to win all its heats without much trouble, defeating the Argonaut Rowing Club of Canada in the final. The final was rowed into a squally headwind, Harvard winning by 3 lengths in 7:40.

The Diamond Sculls were won once more by Joe Burk of the United States, his unorthodox, straight up stroke and high rate giving him his second successive victory in this, R. Verey of Poland being the runner-up. The winner had $1\frac{1}{4}$ lengths at the finish and his time was 9:15. The Thames Challenge Cup, which has been taken frequently in the past by United States schoolboy crews, produced an All United States final when Tabor academy defeated Kent school, the latter the holders. The Zurich Rowing Club won the Stewards Challenge for Fours, Trinity hall of Cambridge took the Visitors Cup for Fours; the Ladies Challenge Plate went to Clare college of Cambridge; the Maidenhead Rowing Club, by taking the Wyfold, contributed a British victory and John Beresford, Jr., and L. F. Smithwood, coming from behind to tie J. Scherlie and Brothie of the Trieste Rowing Club, furnished another British first place in the finals. (R. F. K.)

"Royal Oak": see GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; EUROPEAN WAR; SUBMARINE WARFARE.

Ruanda and Urundi: see BELGIAN COLONIAL EMPIRE; MANDATES.

Rubber and Rubber Manufacture.

Although progress was made in 1939, as in former years, in improving the quality of certain materials used with rubber, no outstanding new commercial development appeared either in materials or in methods of processing and manufacturing rubber goods. Nor were there any startling announcements of new rubber-like synthetic materials which rubber manufacturers might use as an adjunct to their operations with natural rubber. The use of imported Perbunan increased rapidly up to the onset of the European war, when the supply was abruptly stopped. Active progress is being made to synthesize similar materials in the United States. Because of cheaper raw materials and elimination of import duties, development of uses for the American-made product should be stimulated. The use of other rubber-like materials, notably Pliofilm and Koroseal, likewise increased greatly during 1939. Koroseal-insulated building wire for low-voltage circuits, recently announced, is less bulky than the earlier type of conductor sheathed with rubber and braided textile covers. Consequently, larger conductors or more circuits may now be installed in any conduit. This new product not only offers economy in new lighting installations but permits increase in total lighting load on conductors newly installed in old conduits.

Marked progress was made in extending the uses of articles developed in former years. Sponge rubber from latex found greatly increased application in sea cushions and mattresses. It was adopted for automobile seat cushions, and railroads were stimulated to adopt it because of the superior comfort obtained through its use in intercity buses. Conveyor belts combining great strength and flexibility were installed for handling coal underground where space for transport is limited. V-belts, long used for power drives for various types of stationary machines, were increasingly applied on agricultural machinery, particularly on small combines.

These belts, specially designed to withstand shocks caused by

stones or lumps of earth accidentally passing through the machine, have aided greatly in reducing the cost of combined harvester and thresher to a point within the means of the average farmer. Rubber tires, also, have been an important factor in this direction. Increasing numbers of farm implement machines and farm tractors were equipped with rubber tires. During 1939 more than half the farm tractors manufactured were so fitted.

Applications of rubber for reduction of noise and vibration were extended. Wheels for rail-vehicles were constructed so as to support the load of the cars on rubber in shear and to reduce the shocks to rails and to car bodies and greatly diminish noise. Under rails, mainly on bridges and in terminals, tie plates with rubber inserts have been installed. These carry the full weight of rails and cars and successfully decrease noise and vibration. Moreover, plastic rubber sprayed on metal has been found effective in reducing noise inside automobiles and aeroplanes.

The use of rayon cords as reinforcement in high speed tires increased greatly during 1939. Sales of large tires for earth-moving or strip-mining operations were markedly enlarged. Scrapers for stripping earth from the surface require enormous tires, some weighing 750 lb. and capable of carrying a 20,000-lb. load. As aeroplane travel has increased and larger planes have appeared, the predominant sizes of aeroplane tires have shifted to larger dimensions. Puncture-sealing tubes found increased acceptance and the European war developed a need for similar tubes to hold air after bullets have punctured them.

Both rubber and synthetic materials were increasingly utilized for equipment to hold corrosive solutions. Plating baths from which bright nickel is deposited are sensitive to minute quantities of impurities; but rubber linings were designed which serve admirably in this exacting service. Metal tanks were lined with Koroseal to resist the action of nitric acid used for cleaning articles of stainless steel, copper, brass or nickel. Similar containers were supplied for resisting the intensely corrosive action of chromic acid baths for chromium-plating operations.

A number of miscellaneous applications of rubber are of interest. Rubber strips were applied extensively for sealing of joints in roads. These seals are designed to remain below the road surface at all times and effectively exclude water. Hard rubber possessing special electrical properties and moisture resistance was adopted for insulation in radio equipment. Special rubber facing for materials used in filling tree cavities was supplied. Growth of new bark over this rubber was found to be more rapid than over any other material heretofore tried. Rubber insulators for holding telegraph wires on poles were adopted to guard against malicious breakage, and found to permit less surface leakage of electricity than those they replaced. (J. W. Sc.)

Rubber Footwear: see SHOE INDUSTRY: *Rubber Footwear*.

Rugby: see FOOTBALL: *Great Britain*.

Rulers: see SOVEREIGNS, PRESIDENTS AND RULERS.

Rumania. Area 113,919 sq.mi.; pop. (est. Dec. 31, 1938) 19,852,000 (Rumanians 75%; Magyars 8%; Germans 4%). Chief towns (pop. est. July 1, 1938): Bucharest and suburbs (cap., 646,744); Chisinau (112,941); Cernauti (109,821); Iassy (104,597); Galati (102,235); Cluj (100,099). Ruler King Carol II; premier, M. Tatarescu; language, Rumanian; religion, Christian [Greek-orthodox 13,108,227; Greek-Catholic 1,427,391; Roman Catholic 1,234,151 (census figures 1930)].

History.—On February 1, the cabinet resigned. A new Government was constituted with the Patriarch, Miron Cristea, again premier, M. Calinescu vice-president of the council and minister of the interior and of national defence, and M. Gafencu foreign minister. On March 6 the Patriarch died and M. Calinescu be-

came premier. Parliamentary elections were held on June 1 and 2, only candidates for the National Front being allowed to stand; parliament was opened on June 7.

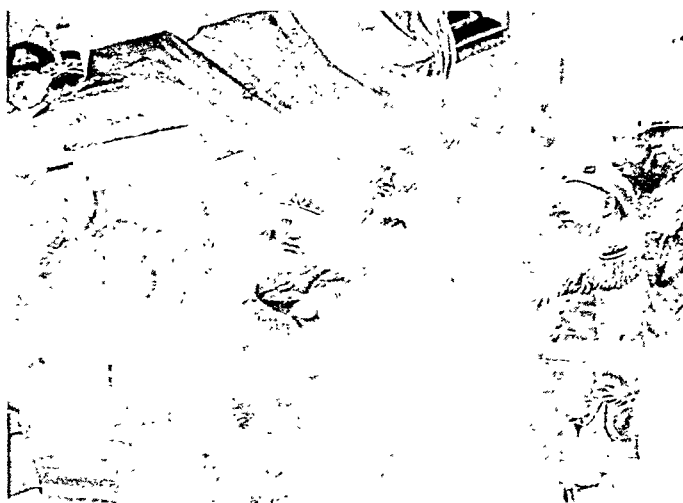
There were several clashes with the Iron Guard in the spring, but policy towards Jews and national minorities (most of which joined the "National Front") was more conciliatory. M. Gafencu remained in close touch with his fellow-statesmen of the Balkan Entente, and also with Poland; but relations with Hungary became severely strained at the Czecho-Slovak crisis of March; troops were called up and remained on the frontier during the summer. When in August M. Gafencu offered Hungary a non-aggression pact, Count Csáky insisted on receiving at least formal guarantees for the Magyar minority as a preliminary.

On March 17 it was reported that a German economic mission in Bucharest had proposed to Rumania a far-reaching agreement whereby Rumania was assured a market for her agricultural surplus in return for her reducing her industries. German experts were to co-operate on favourable terms in developing certain of Rumania's natural resources. The trade agreement actually concluded on March 23 was much less unusual, although Germany was promised a large share in developing Rumania's mines, forestry, oil wells, etc. and undertook to supply arms and munitions extensively. But subsequent trade agreements with France (March 31) and Britain (May 11) somewhat restored the balance. The British and French guarantees to Rumania (April 11) were received "with satisfaction."

On September 6, following the invasion of Poland, Rumania decided to maintain strict neutrality, although the German and subsequent Soviet advance, which wiped out of existence her chief ally, made her position very difficult. She showed an increasing tendency to lean on Turkey, with whose help she hoped to weld the Balkans into a "neutral bloc"; but although her neighbours likewise proclaimed neutrality and disclaimed aggressive inten-



UNENVIABLE POSITION of Rumania after the Nazi-Soviet partition of Poland Sept. 29, 1939, as viewed by Elderman in *The Washington Post*



FUNERAL OF RUMANIAN PREMIER Armand Calinescu, assassinated Sept. 21, 1939, in Bucharest by members of the Fascist Iron Guard

tions, Hungary even withdrawing her troops from the frontier, both Hungary and Bulgaria were unwilling to join any bloc, instead reviving, ever more openly, their claims on Transylvania and Dobruja respectively. In face of these, Rumania declared repeatedly that she would make no territorial concessions.

Meanwhile, M. Calinescu was assassinated on September 21 by a member of the Iron Guard. M. Argeșeanu became premier, being succeeded on September 28 by M. Argetoianu. On November 22, following trade talks with Germany, which was reported to have demanded a more favourable rate for the mark against the leu, the minister for national economy resigned, the whole cabinet resigning next day. On November 24 M. Tatarescu, the former liberal leader, formed a new cabinet which seemed less remote from the old party alignments although M. Gafencu continued as foreign minister. His first task was to give a sharp reply, defending the justice of Rumania's frontiers, to the equally strong comments which Count Csáky had made in his speech on Hungarian foreign policy on November 21. Relations with Bulgaria remained little more satisfactory, and uneasiness was caused by an article in the *Communist International* of Moscow suggesting that the U.S.S.R. proposed to turn their attention to Rumania when they had finished with Finland.

On December 22 Rumania signed a further trade agreement with Germany fixing the rate of the leu to the mark at the lower value of 49-50, providing for an increased export of Rumanian oil to Germany of 130,000 tons monthly, and guaranteeing to Rumania certain deliveries of armaments from the Skoda works.

Education 1937.—Elementary, State schools 15,630; scholars 2,338,851; secondary, all schools 913; scholars 190,272; universities 6; registered students 34,093.

Banking and Finance.—Revenue, ordinary (est. 1939-40) 39,933,000,000 lei; expenditure, ordinary (est. 1939-40) 39,933,000,000 lei; public debt (Mar. 31, 1938) 117,874,300,000 lei; notes in circulation (Aug. 31, 1939) 42,351,000,000 lei; gold reserve (Aug. 31, 1939) 20,667,000,000 lei; exchange rate (Aug. 31, 1939) 655 lei = £1 sterling.

Trade and Communications.—Foreign trade (total): imports (1938) 18,768,000,000 lei; imports (Jan.-Aug. 1939) 15,877,000,000 lei; exports (1938) 21,533,000,000 lei; exports (Jan.-Aug. 1939) 16,891,000,000 lei. Communications and transport: roads, total length (1938) 67,260mi.; railways open to traffic (1938) 2,430mi.; airways (1937): passengers carried 7,697; mail and freight carried 36,125 kilograms; motor vehicles licensed (1937) 39,453; wireless receiving set licences (1937) 218,276; telephones, number of stations (1937) 81,205.

Agriculture and Minerals.—Production in 1938 (in metric tons): petroleum, crude 6,603,000; natural gas 1,725,000,000 cubic

metres; maize 5,098,300; (1939) 6,239,400; wheat 4,821,400; (1939) 4,488,600; barley 832,200; (1939) 1,005,600; rye 517,200; (1939) 474,500; oats 463,100; (1939) 475,900; coal 297,000; lignite 2,084,000; iron ore (metal content) (1937) 63,000; pig iron and ferro-alloys (1937) 127,000; steel (1937) 239,000; potatoes (1937) 2,016,500; beet sugar, refined 139,200; wine 10,400,000 hectolitres; manganese ore (metal content) (1937) 18,300; gold (1937) 5,465 kilograms; soybeans (1937) 70,300; rape-seed (1937) 39,300; hemp (fibre) (1937) 27,000; hempseed (1937) 23,400. Industry and labour: industrial production (1929=100) (average 1938) 131.6; unemployed, registered (average 1938) 7,271; (Sept. 1, 1939) 4,400. (See also BALKAN ENTENTE; EUROPEAN WAR.)

Running: see TRACK AND FIELD SPORTS.

Ruppert, Jacob (1867-1939), American brewer and owner of the New York Yankees baseball team, was born in New York city on August 5. As a young man he inherited his father's brewing business and expanded it into one of the most profitable in the eastern United States. He was a U.S. congressman from 1899 to 1907. With Col. T. L. Huston in 1915 he bought control of the Yankees, and under his ownership the team won ten American League championships and seven world's series. Ruppert bought Huston's interest in 1922. He died in New York city January 13.

Rural Electrification. Progress in the electrification of rural areas of the United States which has been notable since 1935 continued at an accelerated pace during the year 1939. It is estimated that over 1,700,000, or about 25%, of the farms in the United States were receiving central station service on Dec. 31, 1939—an increase of approximately 300,000 for the year. At the end of 1938 about 20.6% of the farms in the United States were receiving electric service; 1937, about 18.2%; 1936, approximately 15.4%; and 1935, about 11.6%.

The greater part of the increase in 1939, as in 1938, was accounted for by the extension of rural electric systems financed by loans from the Federal Government in accordance with the Rural Electrification Act of 1936. The number of rural consumers receiving electric power from these systems was estimated to be 400,000 at the end of 1939 as compared with 176,000 at the end of 1938. Of these consumers, 86% were farms, 6% were non-farm residences and 8% were commercial and industrial enterprises and public buildings. Of allotments totalling \$268,037,293 made by Rural Electrification Administration by the end of 1939 to 690 borrowers located in 45 States, about 91.5% had been lent to co-operative and other non-profit associations, about 6.8% to various public agencies and approximately 1.7% to utility companies. At the close of 1939 these borrowers had more than 180,000 mi. of rural line in operation and approximately 25,000 mi. ready to be energized.

Further progress in making service more widely available to farmers was achieved during the year 1939 by the Government-financed systems. Estimated average cost of line decreased to \$583 a mile during 1939 from \$768 during 1938. Among the outstanding technical advances of 1939 was the development of a low-cost, small-capacity service to enable farmers of very limited income to enjoy minimum benefits of electricity at very low cost. Wider availability of electric service to rural areas will be facilitated through the transfer of Rural Electrification Administration to the United States Department of Agriculture which became effective July 1, 1939. Increasing emphasis during 1939 was placed on aiding farmers to utilize electricity more effectively

in their home and farm activities. A group of co-operative systems reported an increase in average monthly consumption per user from 69 in 1938 to 82 kw.hr. in 1939. An appliance survey conducted during the summer of 1939 among farm consumers who had been receiving service for an average period of 10.5 months showed the following percentages of saturation: hand iron, 84; radio, 83; washing machine, 59; refrigerator, 32; toaster, 31; vacuum cleaner, 21; hot plate, 19; pump, 18; small motor, 18; cream separator, 14; and poultry lights, 10.

In Great Britain, progress resulted from the gradual expansion of rural electric supplies during 1939, it being estimated that approximately 40,000 farms were using electricity during that year. This is in contrast to about 35,000 in 1938, 30,000 in 1937 and 25,000 in 1936. Since there are about 448,000 agricultural holdings of over one acre in Great Britain, it may be seen that less than 10% of the total were electrified in 1939.

Further development of rural supplies in Great Britain was encouraged during 1939. The National Federation of Women's Institutes at its annual general meeting in June passed a resolution which stated that a supply of cheap electricity in rural areas was essential.

Interests of farmers and their associations in wider availability of rural supplies were reflected in an increase in the number of applications for consent to the erection of overhead lines and in the planned programs of the different electricity supply undertakings. Progress in isolated communities has been difficult because of many adverse factors, such as local rates, guaranteed revenues and way-leave opposition. The British Electrical and Allied Industries Research Association has been conducting a plan of research on rural electrification and had sub-committees at work during 1939 on the following phases: standardization and simplification of supply to farms; agricultural applications; and horticultural applications.

Circumstances created by the European war strongly influenced the operations of the supply undertakings during the latter part of 1939. Development and use of electricity in rural areas were affected by the scheme for rationing consumption of electricity and by the mass evacuation of townspeople to safe areas in the countryside. These conditions may have a substantial influence on the development and extension of rural electrification in Great Britain in the immediate future. (See also ELECTRICAL INDUSTRIES; ELECTRIC TRANSMISSION AND DISTRIBUTION; PUBLIC UTILITIES.)

(R. B. C.)

Rural Electrification Administration (REA): see ELECTRICAL INDUSTRIES; RURAL ELECTRIFICATION.

Russell Sage Foundation. The Russell Sage Foundation was created by Mrs. Russell Sage in 1907 as a memorial to her husband. Its purpose is "the improvement of social and living conditions in the United States of America."

The original gift by Mrs. Sage was \$10,000,000, to which she added \$5,000,000 in her will. The income of the Foundation in 1939 was approximately \$575,000 per year.

The Foundation has published over 130 books and over 200 pamphlets. Printing of books, pamphlets, educational measuring scales, forms, catalogues, etc., now average more than 200,000 pieces per year. Its largest annual sale of books was recorded in 1939. Among its most recent publications are: *Social Work Year Book 1939* edited by Russell H. Kurtz; *The Master Plan*, by Edward M. Bassett; *Lawyers and the Promotion of Justice*, by Esther Lucile Brown; *Your Community*, by Joanna C. Colcord; *Housing for the Machine Age*, by Clarence A. Perry; and *Consumer Credit and Economic Stability*, by Rolf Nugent.

(S. M. HA.)

Russia: see UNION OF SOVIET SOCIALIST REPUBLICS.

Russian S.F.S.R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Russo-Japanese Border Conflict: see JAPAN; UNION OF SOVIET SOCIALIST REPUBLICS.

Ruthenia. Ruthenia or Carpathian Ukraine was constituted in the fall of 1938 as an autonomous part of the second Czecho-Slovak Republic. It was regarded at that time as a nucleus for the formation of an independent State embracing all Ukrainians under the protectorate and control of National Socialist Germany. Under the leadership of Prime Minister Mgr. Voloshin it tried to develop the Ukrainian movement through the Uno, the Ukrainian Nationalist Party, and the Sich, the militia organization of the young Ukrainians. Early in March 1939 the Central Government of Czecho-Slovakia tried to combat separatist tendencies in Ruthenia, dismissed one of the ministers, Julian Revay, and appointed General Leo Prchala as a member of the Ruthenian Government. The unrest in Ruthenia, which was soon followed by unrest in Slovakia, was the signal for the complete disintegration of Czecho-Slovakia in the middle of March 1939. Whereas German troops marched into Bohemia and Moravia, and Slovakia proclaimed her independence, Hungarian troops began to occupy Ruthenia. Their occupation put an end to the plans for an independent Ukraine which would have included the Ukrainians settled in the Soviet Union and in Poland. The Ukrainians tried to proclaim their independence and fought, supported by a few Czech troops stationed in Ruthenia, against the invading Hungarians, but their efforts were in vain. Ruthenia was occupied by Hungarian troops, the Sich was disbanded, and the whole territory of about 11,000 sq.km. with 550,000 inhabitants annexed to Hungary. The annexation of Ruthenia gave to Hungary a common frontier with Poland, put the great wealth of timber at Hungary's disposal, as well as the three great railway lines which crossed the Carpathian mountains into eastern Galicia. The conquest of Poland by Germany in Sept. 1939 and the occupation of eastern Poland by the Soviet Union created in Ruthenia a common frontier for Hungary and the Soviet Union which was of special importance in view of the fact that the Soviet Union might wish to incorporate the Ukrainians of Ruthenia into the Soviet Ukraine, and thus to achieve the unification of all Ukrainians, not under German, but under Soviet auspices.

On June 23 the Hungarian Government published a decree about the autonomous administration of Ruthenia the name of which was now changed to Carpathia. According to this decree the capital of Ruthenia is Ungvar. The autonomy which is to be exercised by officers appointed by Hungary covers the interior administration, finances and education. The Ruthenian language is admitted as second official language besides the Hungarian.

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Rye. Declaration of war in Sept. 1939 caused a sharp advance in rye prices, from 34.2 cents a bushel on August 15 to 44

Production of Rye in Certain Countries, 1938 and 1939

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
Germany . . .	369,304,000	362,084,000	Argentina . . .	..	10,826,000
Poland . . .	300,382,000	285,556,000	Bulgaria . . .	9,674,000	7,397,000
Hungary . . .	36,510,000	31,677,000	Yugoslavia . . .	9,637,000	8,262,000
France . . .	25,724,000	31,933,000	Slovakia . . .	7,997,000	..
Lithuania . . .	21,810,000	20,555,000	Estonia . . .	7,441,000	7,403,000
Netherlands . . .	19,062,000	21,694,000	Italy . . .	5,962,000	5,428,000
Rumania . . .	..	20,362,000	Portugal . . .	..	4,051,000
Turkey . . .	..	17,656,000	Greece . . .	2,401,000	2,439,000
Spain . . .	17,212,000	13,661,000	Switzerland . . .	1,374,000	1,447,000
Belgium . . .	..	15,158,000	Luxemburg . . .	549,000	507,000
Sweden . . .	14,818,000	15,377,000	Norway . . .	394,000	433,000
Latvia . . .	..	14,909,000	England & Wales . . .	..	428,000
Finland . . .	12,795,000	14,597,000	Ireland . . .	..	53,000
Denmark . . .	..	11,165,000			

cents September 15, prices received by farmers in the United States. Production of 18 leading countries was 894,870,000bu. in 1939 and 895,523,000bu. in 1938, estimates of the International Institute of Agriculture. These figures do not include U.S.S.R., for which official data have not been available for some years although the Russian rye crop for 1938 was estimated at 787,000,000bu. and the five-year average at 861,930,000 bushels. The rye crop of the United States was 40,834,000bu. in 1939 and 55,039,000 in 1938, preliminary estimate Department of Agriculture; Canada, 13,211,000bu. winter rye in 1939 and 8,363,000bu. in 1938; and 3,338,000bu. spring rye in 1939, and 2,625,000bu. in 1938. (See also CEREALS.) (S. O. R.)

"Safety Zone": see HISPANIC AMERICA AND THE EUROPEAN WAR; INTERNATIONAL LAW; SHIPPING, MERCHANT MARINE.

St. Christopher: see WEST INDIES, BRITISH.

St. Helena and Ascension Island: see BRITISH WEST AFRICA.

St. Kitts-Nevis: see WEST INDIES, BRITISH.

St. Louis, the largest city in the State of Missouri, extends approximately 20mi. along the Mississippi river. covers a total area of 61.3 sq.mi., and has 856,000 persons living within its corporate limits. The populous areas radiating from its boundaries hold, within a distance of 25mi., 526,000 more people. In 1939 began a transformation of the city's "front yard"—the historic levee district, a blighted vestige of a glorious past when Mississippi-steamboats plied a busy and profitable trade. After several years of delay, demolition of 40 square blocks of buildings was started. On the site will eventually rise a beautiful national park memorializing Thomas Jefferson and pioneer westward expansion. The total cost of the project will be \$30,000,000.

While these old riverfront structures were disappearing—many antedated the Civil War—private building construction showed a 30% increase over the previous year. Meanwhile, public construction brought to completion a dream long cherished by the medical centre, the \$1,000,000 Malcolm A. Bliss Psychopathic Institute. Completed also was a railroad deck of the city-owned Municipal bridge across the Mississippi, an undertaking which cost \$2,700,000 altogether and has worried local administrations for years. But their worries were just beginning; the railroads showed a reluctance to use the bridge after all. Belatedly, St. Louis decided upon a program of slum clearance and low-rent housing, with Federal aid. From Washington a \$7,000,000 loan-grant was obtained which will be used for two housing projects to accommodate 1,375 families.

Improvement of national economic conditions contributed a normal addition of new business firms and industrial plants to the commercial life of the city. The cultural life was enhanced by the Art museum, which acquired notable works by Millet, Wimar, Corot, Homer, Benton, Picasso, Sargent, Prud'hon and others. Erected on a city plaza, but not to be unveiled until the spring of 1940, was a \$60,000 group of fountain figures modelled by the famous Swedish sculptor, Carl Milles. The Municipal Opera, internationally known summer open-air theatre, presented 12 musical plays, attracting 686,045 patrons. The city's annual pageant, the Veiled Prophet parade, drew 400,000 spectators.

(E. L. R.)

St. Lucia: see WEST INDIES, BRITISH.

St. Pierre and Miquelon, a French colony comprising St. Pierre, Miquelon, and six smaller islands near Newfoundland. Language, French; capital, St. Pierre (pop. 3,396). The area is about 93 sq.mi.; the population by the latest census was 4,175 (1936), a decline of 158 since

1931. The colony is governed by an administrator and partially elected council. St. Pierre is a regular port of call for several British and French transatlantic lines. The colony enjoys excellent radio communications and cables connect it with Europe and the American continent. The sole industry is fishing, for which the islands are an important centre. The trade has, nevertheless, declined seriously in recent years, with consequent acute economic depression. Exports in 1938 totalled 14,585,000 francs, imports 19,771,000, against 12,673,000 and 13,680,000 francs respectively in 1937. The first half of 1938 showed a decided increase over 1937, with imports 9,223,000 francs and exports 14,271,000. Imports, mostly textiles, salt, wines, foodstuffs, and meat, are from Canada and the United States, who, with the other French colonies, are the best customers. Several factors combined to reduce trade: unsettled world commerce, revaluation, and elimination of the lucrative liquor traffic with the United States. The 1938 budget was balanced at 10,371,900 francs. In spite of efforts to improve the colony's economic condition, it still shows annual deficits. Monetary unit is the French franc (value: 2.25¢ U.S.). Primary education is public, supplemented by two parochial secondary schools. (L. W. BE.)

St. Vincent: see WEST INDIES, BRITISH.

Saito, Hiroshi (1886-1939), Japanese diplomat, was born at Niigata in the province of Echigo, Japan, December 24, and was educated at Peers college and the University of Tokyo, where he received a law degree in 1910. That same year he entered the Japanese diplomatic service. In 1922 he was a delegate to the naval conference in Washington; later he was consul in Seattle, consul general in New York city, and from 1934 to 1938 Japanese Ambassador to the United States. In 1930 he was attaché to the Japanese embassy in London and the next year minister to The Netherlands. Prior to his appointment as Ambassador to the U.S.A. he was senior counsellor to the embassy at Washington. Saito was author of *Japan's Policies and Purposes*, published in the United States in 1935. He died in Washington, D.C. on February 26, four months after retiring because of ill health.

Sales: see RETAIL SALES.

Sales Tax: see TAXATION.

Salvador, El, smallest of the Central American republics, located on the Pacific Coast; language, Spanish; capital, San Salvador (pop. 136,845); president, General Maximiliano Hernández Martínez. The area is 13,172 square miles. The population by the June 1937 census was 1,631,967, with 38% urban, and was officially estimated at 1,685,827 in June 1938. Government is in the hands of the president-dictator, General Martínez. On Jan. 20, 1939, his term of office, due to expire March 1, 1939, was extended to Jan. 1945 by the Constitutional Congress which drew up and adopted a new Constitution. This document did away with the office of vice-president, put the appointment of mayors in presidential hands, and required compulsory suffrage of all adult male citizens. A plot against the Government just before the Constitution was promulgated was quickly put down by troops already mobilized, and the country remained quiet throughout the rest of the year. A new press law was passed by the Congress Jan. 30, restricting publication and editing of all except purely scientific publications to native-born Salvadoreans. Refugees from Europe were refused admission to Salvador by an order issued in July denying entry to "any person expelled from another country." Trade agreements with German firms were cancelled in September when the European war broke out, without losses to

local merchants. Merchandise already received from Germany had exceeded in value the sum of askimark credits held by Salvador.

El Salvador has 604km. of railway, and a rapidly improving highway system featured by a good dirt road as its section of the new Pan American highway.

The principal products are corn (for domestic consumption) and coffee. In 1938 coffee accounted for 87% of the exports, a drop from 91% in 1937. The 1939 coffee crop was estimated to exceed that of 1938, but loss of the German market was expected to hurt this important industry. In 1938, foreign trade declined 22.5% over 1937. Exports amounted to 27,365,000 colones and imports to 22,867,000. The United States took 61.8% of the exports and furnished 46.7% of imports, an increase from 40.4%, at the expense of Germany's share in the trade. The monetary unit is the colón (value 40¢ U.S.). Public school enrolment in 1938 was 89,839, with 11.9% of the national budget allotted to education. (L. W. BE.; C. N. G.)

Salvation Army. The year 1939 was an important one in "the Salvation Army world"—a sphere which embraces some 18,000 corps and employs some 30,000 commissioned officers doing religious and social service work among the less privileged classes of 97 countries and colonies the world around.

The year saw the retirement of General Evangeline Booth, daughter of the Army's founder and one of the most striking women personalities of the 20th century. General Booth, at 73, in obedience to a retirement regulation partly created by herself, surrendered her office to her successor, General-elect George L. Carpenter. The election of the new international head of the Army was effected by the balloting of members of the High Council, convened in London for this purpose during the month of August.

General Carpenter, an Australian by birth and for many years prominent in the organization's literary and executive departments, previously commanded the Army's forces in Canada and South America, advancing its interests in those lands by his progressive and democratic policies.

The year 1939 also witnessed a broadening of a comparatively modern phase of Army ministry: character-building, or "preventive," work among young people. While in no wise slackening its rescue and rehabilitative labours among those whom society at large stamps incorrigible, Salvationists last year pushed the development of a many-phased youth program, creating boys' clubs, Life-Saving Scout, and Guard units (similar to, and in some cases allied with, the Boy and Girl Scouts), summer camps for the young, Torchbearers' clubs (for the evangelization of youth by youth), and many other departments catering to the educational and spiritual needs of boys and girls.

Indicative of the public's increasing acceptance of the Army's peculiar evangel is the increased circulation given its 129 periodicals, chief among which is *The War Cry*, the several editions of which average close to 2,000,000 copies per week. During 1939, *The War Cry's* circulation increased by many thousands per week. For example, the four editions printed in the United States, combining for a national Christmas issue, sold 1,900,000 copies for that single number, said to be the largest circulation ever given a religious journal in America.

But perhaps the most striking service performed by the Salvation Army in 1939 was its quick establishment, on many fronts, of its war work operations. Already labouring during the early months of the year among war victims in China, and courageously tackling the gigantic problem of caring for refugees and orphans left by the Spanish conflict, the declaration of war between Germany and France and England found the Army ready in the competent tradition which gained for it acclaim during 1914-18.

Its naval and military homes, in strategic spots around the world, promptly enlarged their services. A trained force of workers, skilled in the arts of ministering to the comforts of soldiers in front-line positions, was immediately dispatched to the war zones. Huts and canteens, more than 100 in number, were opened in and near virtually all large military and naval bases in Great Britain, France and Finland. In co-operation with governmental agencies, Salvationists and their many institutions of mercy lent invaluable service in the evacuation of children from large cities such as London and Paris.

(E. J. PA.)

Samoa, American, a possession of the United States of America, lies about 2,700 miles east of the northern tip of Australia and 2,200 miles south of the Hawaiian islands; comprises the island of Tutuila and all other islands of the Samoan group E. of longitude 171° W., including Rose island, Tau, Olosega, Ofu, Aunuu, and Swain's. The principal island is Tutuila, area about 40 square miles. Pago Pago, the capital, population about 1,000, has the safest and best harbour in the South seas. Total population on July 1, 1939, 12,785, including 12,562 natives of Samoa (Polynesians); the remainder are foreign born and personnel of the U.S. Naval establishment.

Public schools had an average enrolment of 2,823 during 1938-39. Health and sanitary conditions are excellent. All medical attention is given by naval medical officers who treat the people free of charge. The only bank is the Bank of American Samoa, conducting a commercial banking business as a division of the Treasury of the Naval Government of American Samoa, which owns the capital stock. Copra is the chief export of importance: 1,400 tons, returning \$55,324, were exported during the fiscal year 1939; 360 tons of mats, rugs, and native curios, returning \$47,000, were also exported during the year. The island is solvent and receives no financial aid from the U.S. Government. (L. S. F.)

Samoa, Western: see MANDATES; PACIFIC ISLANDS, MANDATED.

Sand and Gravel. The leading uses of sand and gravel are in building construction and road paving; these account for 80% of the sand and 90% of the gravel consumption of the United States; the only other important use of gravel is as railroad ballast, which takes all but 1% of the remainder, but with sand, ballast accounts for only 2%, while the railroads use an additional 3% as engine sand; there are a number of industrial uses, the most important ones being in foundry work (8%), glass making (4%), and abrasives (1%). The total production decreased by 4% in 1938, as compared with 1937, reaching 57,114,000 short tons of sand and 124,206,000 tons of gravel, a total of 181,320,000 tons.

The combined output of sand and gravel in Canada increased by 13% in 1938 to 30,557,000 short tons. Production in the United Kingdom is less than in Canada, amounting to 21,307,000 long tons in 1937. Of this total 73% was used by the building industry and 18% for road metal and ballast. (G. A. Ro.)

Sand Island: see MIDWAY ISLANDS.

Sandstone: see STONE.

San Francisco, California, U.S.A., central port, financial and marketing centre of the Pacific coast, known as the "City by the Golden Gate;" area, 44.82 sq.mi.; population according to the U.S. census of 1930, 634,394, estimated Jan. 1, 1940, 776,260. Of the city's population, 235,298 were (1930) native whites of native parentage, or 37.1%; 206,285 native whites of foreign or mixed parentage, or 32.5%; 153,386 foreign born

whites, or 24.2%; 39,425 Negroes or of other races, or 6.2%; 338,033 males and 296,361 females.

More than \$100,000,000 of major construction was under way at the turn of the year in the San Francisco Bay Area with approximately \$50,000,000 in a shipbuilding program, \$35,000,000 in naval supply and naval air bases and other Federal projects on Government Island and the agricultural laboratory at Albany. In addition \$15,000,000 will be spent by the Pacific Gas and Electric company for the construction of three power plants in Contra Costa county in the vicinity of the refineries of the Tidewater Associated, Shell, and Union Oil companies. The \$10,000,000 aeronautical research station at Sunnyvale will also be under way.

The 1939 Golden Gate International Exposition brought 10,496,203 visitors to Treasure Island. Of this total, approximately 4,900,000 persons went via the San Francisco-Oakland Bay bridge. Preliminary estimates on the value of the Exposition to the San Francisco Area, presented by the San Francisco Chamber of Commerce, indicated that approximately \$70,000,000 was expended by visitors to the San Francisco Bay Area.

Education.—There are 181 public schools in San Francisco, including 72 kindergartens, 82 elementary schools and 26 high schools, supplemented by numerous private, parochial, non-sectarian and technical schools. It is estimated that there are several thousand children in the city attending private schools. The University of San Francisco and the San Francisco State Teachers' college are located in the city and the University of California at Berkeley, and Stanford university at Palo Alto, are both within easy commuting distance of San Francisco. In addition, the University of California maintains several branches in San Francisco, including colleges of medicine, dentistry, pharmacy and law, and the California School of Fine Arts; Stanford university's colleges of dentistry and medicine are also located in San Francisco.

Trade.—San Francisco contains the most compact market in the West, with 15,105 persons per square mile. Only New York, Boston and Philadelphia exceed this density. The effective buying power of these people is the equivalent of 1,127,675 "average" Americans. The effective buying income per family in San Francisco amounts to \$3,360, compared to \$2,893 in California, \$2,788 in the Pacific Coast, and to \$2,392, the average for the nation. The retail sales in San Francisco are estimated at \$300,000,000, and wholesale sales at the tremendous sum of \$1,400,000,000. Sales at retail per capita amount to \$443, leading all other key cities of the coast. Sales at wholesale exceed those of any other coast city.

Transportation.—Converging in San Francisco are seven major transcontinental rail routes, 177 steamship lines, more than 30 truck lines; four transcontinental bus services, three transcontinental air transport routes and the famous transpacific Clipper fleet. Today, San Francisco is the terminus of four Class I railroads and a number of short lines. Since the San Francisco-Oakland Bay bridge was opened on November 12, 1936, it has been crossed by 28,650,000 vehicles and more than 80,000,000 passengers have been carried over the bridge by motor vehicles or commuters' trains. The bridge has taken in \$15,300,000 and it is estimated it has effected a saving of \$10,268,000 to motorists in lowered fares. During the three years it was estimated that motor vehicle mileage over the bridge amounted to 236,362,500 and that a total of 14,772,656 gal. of gasoline were consumed at an estimated cost of \$2,732,941, and that the State gasoline tax on this gallonage amounted to \$443,179. (G. L. N.)

San Francisco Bay Bridge: see CALIFORNIA; SAN FRANCISCO.

San Francisco Fair: see ARCHITECTURE; ART EXHIBITIONS; ART GALLERIES AND ART MUSEUMS; CALIFORNIA; ELECTRIC LIGHTING; FAIRS AND EXHIBITIONS; INTERIOR DECORATION; LUMBER; SAN FRANCISCO.

San Marino, a tiny republic of 38 sq.mi. in the Apennines, S.W. of Rimini, entirely surrounded by Italian territory, is ruled by a Grand Council and two Regents ("Capitani Reggenti") appointed therefrom to exercise executive powers. The population (Sept. 1938) was 14,389, giving a density of about 379 per square mile. The capital (of the same name) has about 2,000 inhabitants. There is an electric railway to Rimini. Italian currency is in use, but there is a local silver coinage, and a separate issue of postage stamps. The budget estimate for 1938-39 balanced at 5,474,673 lire.

Santo Domingo: see DOMINICAN REPUBLIC.

Sao Thome: see PORTUGUESE COLONIAL EMPIRE.

Sarawak: see BORNEO.

Sargent, John Garibaldi (1860-1939), attorney-general of the U.S.A. during the presidency of Calvin Coolidge, was born in Ludlow, Vt., on October 13 and was educated at Tufts college. Admitted to the bar in 1890, he became attorney-general of Vermont in 1908. Coolidge appointed him to the cabinet in 1925 after the U.S. Senate had withheld confirmation of Charles Warren as attorney-general. He died in the town of his birth on March 5.

Saskatchewan, the middle of the three prairie provinces of Canada, was created a province by the Dominion Parliament Sept. 1, 1905. It has a total area of 251,700 sq.mi.; population 949,000 (estimate, Dominion Bureau of Statistics, 1939). The seat of Government is Regina.

History.—The Liberal Party, elected June 8, 1938, continued in power under the premiership of W. Patterson. There were no political or other happenings of special significance during 1939.

Economic.—The wheat crop for 1939 (wheat growing is the first industry of the province) was 239,000,000 bu. as compared with 132,000,000 in 1938, and 37,000,000 in the drought year 1937. Other grain crops were in bushels, oats 115,000,000 (90,000,000, 1938), barley 26,000,000 (20,000,000, 1938), rye 9,300,000 (3,400,000, 1938) and flaxseed 1,150,000 (725,000, 1938). The total value of all field crops for 1939 is estimated at \$165,150,000 as compared with \$101,388,000 for the previous year, a gain of 63%. Aggregate farm capital has now reached approximately \$1,000,000,000. Other main sources of income were minerals \$7,782,847, manufacturing, \$62,205,884, fisheries \$468,646, for 1938. Incomplete figures show these were exceeded in 1939. Mining progress in the north of the province was reflected in the addition of 26,500 h.p. to the hydro plant at Island Falls on the Churchill river and a new installation (3,300 h.p.) at Wellington lake on Charlot river for use at Goldfields. (J. T. C.)

Sassoon, Sir Philip (ALBERT GUSTAVE DAVID) (1888-1939), British statesman, was born December 4 of a distinguished Jewish family, the British branch of which had been founded by his great-grandfather. He was educated at Eton and at Christ Church, Oxford. Sir Philip entered Parliament in 1912 at the age of 23 and was at that time its youngest member. During the World War he was private secretary to Field Marshal Sir Douglas Haig, commander in chief of the British armies in France. He was twice under-secretary of state for air, from 1924 to 1929, and from 1931 to 1937. In 1937 Neville Chamberlain appointed him first commissioner of works in his cabinet. Sir Philip was a bachelor and was believed to be one of England's wealthiest men. He died in London on June 3.

Saturn: see ASTRONOMY.

Saudi Arabia: see ARABIA; ISLAM.

Sauveur, Albert (1863-1939), American metallurgist, was a native Belgian, born at Louvain on June 21. He was educated at the Athénée Royal in Brussels, at the School of Mines in Liège, and at the Massachusetts Institute of Technology, where he received his bachelor's degree in 1889. Many of his colleagues called him a founder of the science of metallography, and he was thus cited in an honorary Sc.D. degree from Harvard in 1935. He joined the faculty of Harvard in 1889 and was professor of metallurgy there from 1905 until his retirement in 1935. As one of the acknowledged world's experts on the metallurgy of iron and steel he was called upon during the World War to advise the American Aviation Commission in France and the French Ministry of Munitions. His many honours included the Bessemer gold medal of Great Britain in 1924 and the first Albert Sauveur achievement medal of the American Society for Metals. He died at Boston on January 26.

Savings Banks, Mutual. Assets and deposits of mutual savings banks in the United States increased in the year ending July 1, 1939. Total assets were \$11,741,000,000, on July 1, 1939, an increase of \$213,900,000 over July 1, 1938, as compared with an increase of \$40,400,000 during the year ending July 1, 1938. Deposits credited to 15,400,112 accounts reached a new high of \$10,390,000,000 on July 1, 1939. The combined surplus remains unchanged at \$1,314,000,000 or 12.60% of total deposits. Dividends averaged 2.17% in 1939, a slight decrease from the average of 2½% in 1938. Decreases by individual institutions were announced to become effective during the second half of 1939. During the year two banks were absorbed by mergers reducing the total number of banks to 541.

Although Government bonds continued to be the chief outlet for investments, there was evident a renewed activity in new mortgage loans. Approximately 22% of such loans made during the six months ending June 30, 1939, were insured by the Federal Housing Administration. Nearly 40% of all the savings banks have become "approved mortgagees" under the Federal Housing Act and are, therefore, in a position to make insured loans. This type of loan has been well received by the public. An important reason for its popularity is the elimination of the second mortgage and by virtue of the system of regular monthly payments of interest on principal it is possible for the Government agency to insure loans up to 90% of the appraised value of the property. The Federal plan has done much to demonstrate to borrowers the desirability of reducing their mortgage debt periodically.

Progress is being made in converting old mortgage loans to an amortized basis under which loans are repaid in fixed and regular small instalments. This development was in large part a result of the education of borrowers by the activities and example of the Federal Government, both in the Home Owners Loan Corporation and the Federal Housing Administration.

Perhaps the outstanding development in 1939 in the mutual savings banks was the establishment of insurance departments in New York banks. The law permitting savings banks in New York State to establish an insurance department became effective Jan. 1, 1939, and on January 6 three banks in New York city opened their insurance departments for business. A bank in Rochester followed suit on January 24, and in April a bank in Troy and another bank in New York city joined the list of issuing banks. In addition to the six issuing banks, seven banks located in various parts of the State have become agency banks. By October 1 there was \$5,574,000 of insurance in force representing 6,699 policies. In Massachusetts, the first State in which savings bank life insurance was sold, it was over eight years after the first policy was sold before the total insurance in force exceeded \$5,000,000. Now, after 31 years in the field, Massachusetts banks have over \$170,000,000

in force representing more than 190,000 policies. At present there are in the State of Massachusetts 26 issuing banks and 101 agency banks. As a result of the interest created by the passage of the New York law similar bills were introduced in the States of New Jersey and Ohio.

The unsettled international conditions had little evident effect on savings in Great Britain. During the year ending April 30, 1939, balances in Trustee Savings Banks increased £16,000,000 to a total of £284,200,000 while the balances in the Post Office Savings bank rose from £654,000,000 to £694,000,000. As of March 31, 1939, the National Savings Certificates outstanding totalled £518,900,000, an increase of £2,100,000 during the preceding 12 months.

In France, savings banks did not enjoy an uninterrupted growth in deposits during the year ending May 31, 1939, although the net change for the year was an increase of 2,000,000 francs to a total of 41,000,000,000 francs. Under the decree-law of Nov. 12, 1938, a limitation of 20,000 francs was placed on the amount of deposits that may be paid into an account in any one year after July 1, 1939. This decree was not received favourably by the banks.

In Germany, the Savings Bank Federation issued a special edition of its fortnightly publication to commemorate the passing of a century since the promulgation of the "Regulations Concerning the Organization of Savings Banking." These regulations are still the basic laws under which the savings banks operate although amendments have been made, such as the reorganization decree of 1932.

(HE. BR.)

Sayre, Francis Bowes (1885—), U.S. statesman and attorney, was born April 30 at South Bethlehem, Pa. and received his A.B. degree from Williams college in 1909 and his LL.B. degree from Harvard three years later. In 1913 he was married to Jessie Woodrow, daughter of President Wilson, at the White House (she died Jan. 15, 1933). He was deputy assistant district attorney of New York county in 1912-13, assistant to the president and instructor in Government at Williams college from 1914 to 1917, and a teaching fellow in 1917-18 at Harvard Law school, where he received a doctorate of juristic science. From 1919 until 1934 he remained on Harvard's faculty, first as assistant professor, then full professor of law and director of the university's Institute of Criminal Law. He was an adviser in foreign affairs to the Siamese Gov't from 1923 to 1925 and during the next five years, as jurisconsult to the ministry of foreign affairs, negotiated many important political treaties which eventually abolished extraterritoriality in Siam. He was appointed assistant U.S. secretary of State by President Roosevelt in 1933 and in this position directed the negotiation of reciprocal trade agreements under Cordell Hull. He had been chairman of the U.S. Interdepartmental Committee on the Philippines since 1934, and on July 26, 1939 President Roosevelt appointed him U.S. high commissioner to the Philippines to succeed Paul V. McNutt. Sayre is the author of case-books on criminal, labour and admiralty law; also of *America Must Act* (1935).

Sbarretti, Donato (1856-1939), Italian cardinal, was known as one of the staunchest supporters of fascism in the administration of the Roman Catholic Church. Born on November 12 at Montefranche, near Rome, he received doctorates in both law and theology, and was ordained priest April 12, 1879. Entering the diplomatic service of the church, he was appointed a member of the papal delegation sent to the United States in 1893 to establish an apostolic mission. Later he was apostolic delegate to the Philippines and, in Jan. 1900, he was made Bishop of Havana. Thereafter he was apostolic delegate to Canada for ten years before he returned to Rome to

become assessor of the holy office. On Dec. 4, 1916, Pope Benedict XV created him a cardinal. Pius XI made him a cardinal bishop and vice dean of the Sacred College. At the time of his death in Vatican City on April 1, he was secretary of the congregation of the holy office.

Scheidemann, Philipp (1865-1939), German statesman, was born at Kassel on July 26. He entered the Reichstag in 1903, later became leader of the Social Democrats, and proclaimed the German Republic Nov. 9, 1918. At the Weimar assembly in 1919 he was selected first Chancellor of the republic but resigned in June 1919 rather than sign the Treaty of Versailles. He went into exile in 1933 and died at Copenhagen November 29. See *Encyclopædia Britannica*, vol 20, p. 63.

Schelling, Ernest Henry (1876-1939), U.S. composer, pianist and conductor was born July 26 at Belvidere, New Jersey. After studying for four years under Paderewski in Switzerland he began his career as a concert pianist with a successful tour of Europe. During the World War he served with the American Expeditionary Forces in France and was awarded the Distinguished Service medal. Later he conducted children's concerts for the New York Philharmonic and other orchestras and from 1936 to 1938 was conductor of the Baltimore Symphony orchestra. Among his compositions for orchestras are *Légendes Symphoniques*, *Symphony Fantastic Suite*, *Impressions*, *Morocco* and *Victory Ball* (based on the poem by Alfred Noyes). He died in New York city December 8.

Schizophrenia: see NERVOUS SYSTEM; PSYCHIATRY.

Schneider, Herman (1872-1939), U.S. educator and engineer, was originator of the co-operative plan of education in American universities, whereby students are employed in private industry, while pursuing their studies. Born in Summit Hill, Pa., on September 12, Schneider as a youth was a carpenter's apprentice and paid for his education at Lehigh university by working in an engineering office. His experience with alternate study and work in industry led him to formulate his own theories of practical training in engineering. He gave up practice as an engineer and specialist in structural iron work to accept an instructorship at Lehigh in 1899, and four years later he became assistant professor of civil engineering at the University of Cincinnati. In 1905 he persuaded the administration of the university to introduce the co-operative plan into its engineering curriculum.

The success of the plan was such that it was later adopted, in one form or another, by most of the large American schools of technology and engineering, and even by colleges of commerce and liberal arts. Schneider was president of the University of Cincinnati from 1929 to 1932 and dean of its college of engineering and commerce until his death on March 28.

Schwab, Charles Michael (1862-1939), American industrialist and financier, was born at Williamsburg, Pa. on February 18. After a brief education he was employed as a stake-driver by the Carnegie Steel company in 1881; by 1897 he was president of the company, and in 1901, when it merged with the U.S. Steel corporation, he became first president of the latter. About two years later he organized the Bethlehem Steel corporation. During the World War, prior to America's entry, his company sold steel and steel products to the Allies valued at more than \$200,000,000. When the United States entered the war, Schwab was chosen as director-general of the



Emergency Fleet corporation, a position he held until after the Armistice, when he returned to the Bethlehem Steel corporation as chairman of its board of directors. From 1926 to 1932 he was president of the American Iron and Steel institute. He died in New York city on September 18. See also *Encyclopædia Britannica*, vol. 20, p. 111.

Scotland: see GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Sculpture. Sculpture proved itself in 1939 in many ways one of the most flourishing of the arts. It revealed this status in the exhibition field, in the completion of public monuments and memorials, in the acquisitions of sculpture by public collections, and by various projects initiated for the use and promotion of sculpture. The two international expositions held in the United States gave striking illustrations of sculpture's prominence in the art field and afforded sculptors an additional stimulus to creation. Some notable achievements were recorded both in America and in Europe.

Though the European war inevitably tended to dislocate plans for sculptural work in Europe, leading nations made definite attempts to foster the continuance of art expression and to provide commercial outlets for their talents.

The democratization of art under the influence of the Government Works Progress Administration continued to stimulate sculpture both in practice and appreciation, and was instrumental chiefly in encouraging new talents through the means of enabling them to participate in open competitions for public art works. Local Federal art projects, functioning on a relief basis, provided much useful and attractive sculpture which was allocated to schools, libraries, hospitals, and other publicly supported institutions. National exhibitions in the larger cities served best to illustrate the trends of the times, which were suggested by work in new experimental forms. A strong current of social consciousness was perceptible in many sculpture shows, reflecting the popular trend of the Federal program.

At the New York World's Fair the solid architectural masses of the main exhibit area were relieved and enhanced by striking sculpture groups, heroic figures representing a wide variety of historical, mythological, and modern subjects. In size the figures ranged from the 65ft. statue of George Washington, dominating the main mall, to the sprightly terra cotta figures of modern cherubs in one principal fountain display. The 35 sculptors who conceived the work were chosen by the board of design and represented noted as well as little known artists. Sculpture also figured prominently in the decorative pattern of the San Francisco Exposition. In both instances the sculpture was largely of impermanent construction, and not destined generally for lasting preservation.

In the exhibition field the Whitney Museum of American Art again served to bring together one of 1939's most comprehensive groups of sculpture by contemporary artists. Opportunity for the exhibition of recent work was afforded a large number of young and older artists, however, through an outdoor exhibition held in New York, N.Y. by the newly organized Sculptors' Guild. The 120 exhibits by 60 sculptors, displayed in a vacant lot adjoining one of New York's principal thoroughfares, were shown throughout the spring and early summer of 1939, and attracted particular attention. The major event in the historical field, on the other hand, was the display of early Roman sculpture and other art held by the Metropolitan Museum of Art to celebrate the anniversary of the Emperor Augustus. This was noted especially for its classical portraiture and threw a revealing light on the art and personalities of the Augustan era in Rome.



THE LAST of Gutzon Borglum's giant stone heads of four American presidents—that of Theodore Roosevelt—was unveiled on Mount Rushmore, South Dakota, July 2, 1939



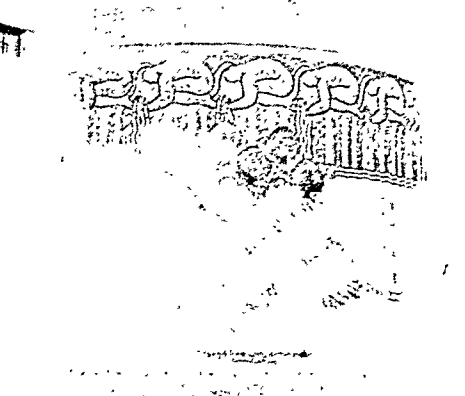
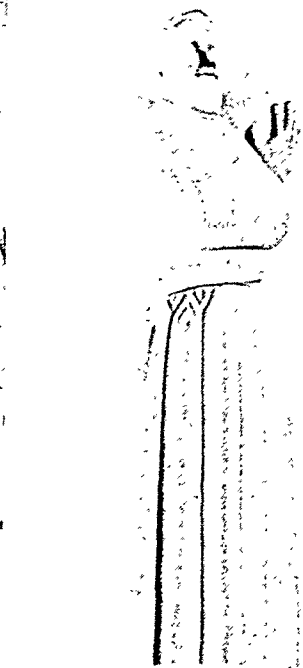
Above: "EUROPA," by Gleb W. Derujinsky, at the New York World's Fair in 1939

Right: "MOSES" by Alexander Archipenko, completed in 1939

Centre: "LEWIS AND CLARK," cast-stone relief for the Department of Interior building, Washington, D.C., by Heinz Warneke, installed May 16, 1939

Below, left: "STABILE," an abstraction in Plexiglass by Alexander Calder, won first prize in a national competition and was exhibited at the New York World's Fair in 1939

Below, right: "GUARDIAN OF WATER" by Donal Hord for the San Diego civic centre, dedicated June 10, 1939



Leading museums were fortunate in acquiring several notable sculptures. The Frick collection, opened as a public institution several years ago, obtained a life-size terra cotta statue of Diana the Huntress by the French 18th century sculptor, Jean Antoine Houdon, thereby taking possession of the only replica in terra cotta which Houdon made of one of his most celebrated figure subjects. The statue once belonged to Cardinal Fesch, uncle of Napoleon. The acquisition by the Toledo museum of a stone relief by Desiderio da Settignano of "St. Cecilia" also marked an important addition to the public collections of Renaissance sculpture in its most exquisite form, through the gift of Edward Drummond Libbey. Except for several pieces acquired by museums devoted to latter-day art, such as the Whitney museum and the Museum of Modern Art, contemporary acquisitions were few and not such as to give great importance to any particular artist.

The unveiling of Jo Davidson's statue of Will Rogers, the cowboy humourist and philosopher, in the statuary hall at the national Capitol in Washington, marked a principal addition of 1939 to the store of public sculptural monuments. Presented by Oklahoma, it serves as a valued instance of the public's interest in sculpture as a means of commemorating a national personality. Others completed were a bronze statue of Walt Whitman by the same artist, to be set as a monument to the poet in the Palisades Interstate park, New York, and a symbolical group entitled "Meeting of the Rivers" by Carl Milles, erected at St. Louis, near the junction of the Mississippi and Missouri rivers.

The year's most celebrated controversy was that created in London in June by the exhibition of Jacob Epstein's squat 7ft. figure of Adam, carved in a three-ton mass of alabaster. Considered "shocking" by some, it exemplified for others "the story of man's evolution from the primitive—a figure more powerful than the most powerful animal." There were few such sensations, however, in the year. (See also ART EXHIBITIONS.) (C. BU.)

Sea Blockade: see BLOCKADE.

Secondary Education: see EDUCATION, SECONDARY.

Secondary Metals. The recovery of secondary metals in the United States and their re-

Secondary Metals Recovered in the United States

	1936	1937	1938
Copper—Thousands of short tons			
As metal	260.0	285.6	192.4
In alloys	224.6	246.5	107.4
Total	484.6	532.1	359.8
Percentage*	65	62	60
Lead—Thousands of short tons			
As metal	137.5	154.5	119.4
In alloys	125.4	120.6	105.5
Total	262.9	275.1	224.9
Percentage*	42	41	41
Zinc—Thousands of short tons			
As metal	68.0	64.5	42.3
In alloys	54.1	62.8	44.8
Total	122.1	127.3	87.1
Percentage*	21	21	21
Tin—Thousands of short tons			
As metal	7.2	8.3	4.9
In alloys†	20.8	22.0	18.7
Total	28.0	30.3	23.6
Percentage*	34	35	42
Aluminium—Thousands of short tons			
As metal	20.9	29.4	16.7
In alloys	30.6	33.2	22.1
Total	51.5	62.6	38.8
Percentage	42	38	26
Nickel—Thousands of short tons			
As metal	0.9	0.9	0.8
In alloys†	1.1	1.5	1.5
Total	2.0	2.4	2.3
Percentage*	5	5	10
Antimony—Thousands of short tons			
As metal	9.2	11.5	7.8
In alloys	0.7	0.8	0.7
Total	9.9	12.3	8.5
Percentage*	66	68	73
Platinum—Thousands of Troy Ounces			
As metal	56.0	55.9	44.7
Percentage	50	59	51

*Ratio of secondary recovery to consumption of new metal.

†Includes some in chemical compounds.

turn to industry for re-use has grown to such an extent that in many cases the yield is so large a proportion of the total consumption that the consuming industries would be seriously handicapped without access to this additional supply; on the other hand, secondary recovery is viewed unfavourably by the primary producer, because it restricts the demand for new metal.

Very little information is available on secondary recovery outside of the United States. No other country has developed it to the degree prevailing in the United States, but pressure of circumstances has probably pushed it farther in Germany than elsewhere.

Indirect data from Germany indicate a secondary copper recovery of 80,900 metric tons in 1938, or 22% of the new supply; lead recovery was 22,500 tons, or 9% of new supply; and zinc recovery was 15,200 tons, or 6% of new supply. (G. A. Ro.)

Second World War: see EUROPEAN WAR.

Securities and Exchange Commission (SEC): see BANKRUPTCY; LAW (CASE): *Securities*; LEGISLATION, FEDERAL; STOCK EXCHANGES.

Seeing Eye, the corporate society that educates dogs to be the trusted guides and friends of blind men and women, had in 1939 the most successful year since its inception in 1928 when Mr. Morris Frank brought his German shepherd, Buddy, from Mrs. Harrison Eustis's kennels in Switzerland. Bred for "character" and trained by Mrs. Eustis and Mr. Elliott S. Humphrey, the geneticist, Buddy was the dog that proved 'Seeing Eye dogs could safely guide blind people through heavy American street traffic; and it is primarily due to her that in 1939, 450 dogs were leading their 450 blind owners from darkness and dependence into light and liberty. Even in death—for Buddy drew her last faithful breath, in the summer of 1938, still by her master's side—she continues her Seeing Eye work. Mr. Frank now has a handsome male dog for guide and friend; but the first "buddy" is not forgotten.

Seeing Eye dogs are now working in 45 of the United States, and in the District of Columbia, and in Canada. Some dogs are "attending college" as pilots to student masters; others are engaged as guides in such diversified occupations as the law, teaching, the ministry, journalism, music and a great variety of mercantile pursuits, including selling insurance and groceries, and raising poultry. In addition to the increased number of trained dogs produced in 1939 for those blind persons mentally and physically capable of benefiting from a dog, the Seeing Eye made notable progress in informing a sympathetic public of the Seeing Eye's need for financial support—each dog costs many times the amount paid by the blind purchaser.

BIBLIOGRAPHY.—Ruth Adams Knight, *A Friend in the Dark* (1937); Alice Crewe and Fleming Gall, *Each in his Way* (Oxford, 1937); *The Story of The Seeing Eye* (The Seeing Eye, New York, 1938). (B. TA.)

Seismology maintained progress through August, and it is not possible (Jan. 1, 1940) to appraise the effects of events after that date. Major earthquakes in central Chile on Jan. 24, 1939 and in central Turkey on December 27 caused widespread destruction and loss of life. Severe aftershocks followed the earthquake in Turkey, continuing into the new year and adding to the destruction. (See also CHILE.) A destructive earthquake on June 18, at Accra, Gold Coast, Africa, was in a rather unusual locality.

Strong earthquake motion has been measured, and has been analyzed by mechanical as well as by mathematical methods. Information thus obtained has been applied to the design of many kinds of structures, including dams, bridges, water towers, and buildings. Models of proposed structures have been tested on shaking platforms constrained to reproduce actual earth motions. Effec-

tive building construction codes have been adopted where necessary and are being improved as information is perfected.

A seismograph has been adapted to the conditions to be encountered by the U.S. Antarctic Expedition.

Study of deformation of the earth's crust by laboratory methods has been continued, with pressures up to 50,000 atmospheres, corresponding to a depth of 100 miles.

Though general earthquake prediction is regarded as impossible, attention has been given to the possibility of determining whether stress is growing in the crust which may lead to earthquake, by means of triangulation, levelling, tilt measurement, and listening to sounds possibly related to earthquake along great fault planes.

(N. H. H.)

Selenium. The bulk of the selenium output of the world is as a by-product in copper refining in the United States and Canada; Sweden, the Soviet Union, Mexico and Japan have some production, but no statistics are available. Production in the United States amounted to 435,800lb. in 1937, declining to 225,700 in 1938, with imports of 101,072 pounds. Production began in Canada in 1931, and reached 397,200lb. in 1937. The chief use is in the glass industry as a decolorizer and as the colouring agent for red or ruby glass; other uses are in pigments, rubber vulcanization and flame-proofing; one of the most promising of the newer uses is the addition of selenium to copper alloys and steels to improve the machinability.

(G. A. Ro.)

Seligman, Edwin Robert Anderson (1861-1939), U.S. economist, was born in New York city on April 25, the son of the founder of the banking firm, J. & W. Seligman and Company. He was tutored as a child by Horatio Alger, author of boys' books. In 1879 he received his bachelor's degree from Columbia university, in 1884 his M.A. and LL.B., and in 1885 his doctorate of philosophy. At the age of 20 he began his famous collection of 50,000 books and pamphlets which he sold in 1930 to Columbia university for \$500,000—one-half its estimated value. In 1885 he was appointed a lecturer in economics at Columbia and he remained on the faculty as professor of political economy and finance until his retirement in 1931. Meanwhile he had served on a number of taxation committees and his advice on economic policies was sought by nations the world over. In 1922 and 1923 he was an expert on the League of Nations committee on economics and finance, and from 1918 to 1925 he was a special adviser to the Ways and Means committee of the U.S. House of Representatives. Perhaps the most famous of his commissions was his study of the tax structure of Cuba. In 1931 he completed a report which became the basis of Cuban tax laws and attracted the attention of economists generally for its omission of consumption taxes and its emphasis upon direct levies. Seligman opposed all forms of the sales tax which he deemed unjust. He was the author of some 15 volumes on taxation and general economic subjects, including *The Income Tax* (2nd ed., 1914), *Essays in Taxation* (10th ed., 1925), *Principles of Economics* (12th ed., 1929), *The Economics of Farm Relief* (1929), *Price Cutting and Price Maintenance* (1932), and *Economic Interpretation of History* (2nd ed., 1937). He died at Lake Placid, N.Y., July 18.

Senate: see CONGRESS, UNITED STATES.

Senegal: see FRENCH COLONIAL EMPIRE.

Serbia: see YUGOSLAVIA.

Serum Therapy. Serums of various types, as well as anti-toxins, toxin-antitoxins, toxoids, vaccines and other immunizing agents are being widely employed for the

diagnosis, modification, prophylaxis and treatment of disease. During 1939 two chemotherapeutic agents, 'sulphanilamide and sulphapyridine, have been employed, alone or in combination with immunizing agents, for the treatment of many diseases previously amenable only to the immunizing agents.

Diseases which are treated by the use of serums, vaccines, etc., are acne caused by the bacillus acne, anthrax, bacillary dysentery, botulism, diphtheria, erysipelas, gas gangrene, measles, meningococcic meningitis, plague, pneumococcus pneumonia, pneumococcus meningitis, scarlet fever, snake bite (North American—rattlesnake, copperhead, water moccasin; South American—fer-de-lance and other *Bothrops*, and British—cobra and viperine), staphylococcus and streptococcus infections, tetanus, tularemia and undulant (Malta) fever.

The use of typhoid vaccines in the treatment of typhoid has never become well established, and the use of immunizing agents in the treatment of whooping cough is still experimental.

Diseases in which diagnosis is confirmed by the use of serums and related preparations include chancroid, diphtheria, leishmaniasis, tuberculosis, scarlet fever, typhoid, paratyphoid, typhus and undulant fevers. Experiments have been conducted with the diagnosis of meningitis and whooping cough, but such procedures are not established.

The following diseases may be prevented by the use of immunizing agents: cholera, diphtheria, gas gangrene, measles (which may also be modified so that permanent immunization occurs), rabies, smallpox, tetanus, scarlet fever, typhoid, paratyphoid and typhus fevers. Some experimental work has been done in attempts to prevent erysipelas and chancroid, but the work is not well established.

Typhoid vaccine continues to be employed in non-specific protein therapy, and normal horse serum is used in certain haemorrhagic conditions.

Convalescent human serum has been used in the treatment of measles and scarlet fever, and experimentally for the treatment of poliomyelitis and the prevention of mumps and chicken-pox. Human serums have been used in the treatment of shock, haemorrhage and burns.

Serums are available for the treatment of all types of pneumonia from I to XXXII, and of these, serums for Types I, II, V, VII and VIII have become official preparations, both as horse serums and as the newer rabbit serums.

Immune globulin (human), as well as convalescent serum, is used in the prevention, modification and treatment of measles. Experimental work continues with well-controlled studies of Phase I whooping cough vaccine. The use of oral vaccines for the prevention of the common cold and typhoid fever is not established. There are still no established immunizing agents for the treatment or prevention of the common cold, influenza, gonorrhoea or poliomyelitis. (See also COLD, COMMON; PNEUMONIA.) (P. C. B.)

Sewage Disposal: see PUBLIC HEALTH ENGINEERING: *Sewage Treatment*.

Seychelles: see BRITISH EAST AFRICA.

Sharpening Stones. The name sharpening stones is used to designate the small, hand operated varieties of stones used for sharpening tools, as distinguished from the large power-driven grindstones. Scythstones and whetstones are produced from schist in New Hampshire and Vermont; rubbing stones from sandstone in Indiana and Ohio; and oilstones from novaculite in Arkansas and Kansas. The tonnage is small (511 short tons in 1938), but the small size of the units permits this amount to cover an extensive use.

(G. A. Ro.)

Shasta Dam: see DAMS.

Sheep. The number of sheep and lambs on United States farms Jan. 1, 1940, was estimated by the Department of Agriculture as 54,473,000 head, valued at \$342,893,000, compared to 53,783,000 head valued at \$309,280,000 a year earlier. The average price of sheep and lambs per head was reported as \$6.29 Jan. 1, 1940, and \$5.75 Jan. 1, 1939.

Of the increase of 690,000 head, 177,000 were sheep and lambs on feed for market and 513,000 were stock sheep. Stock sheep in the United States Jan. 1, 1940, numbered 48,473,000; a year earlier, 47,960,000.

New Zealand, one of the largest producers, reported a decline: 31,858,000 as of April 30, 1939, compared to 32,379,000 a year earlier. Figures from official sources and from the International Institute of Agriculture show the number of sheep in different countries in 1939 and 1938 as follows:

	1939	1938
Canada	3,365,800	3,415,000
United Kingdom	26,903,700	26,775,400
England and Wales	17,976,000	17,912,500
Scotland	8,042,000	7,969,000
Northern Ireland	894,600	893,400
Germany	5,712,423	5,679,125
Hungary	1,868,122	1,628,730
Netherlands	689,501	654,251
Estonia	694,700	649,700
Latvia	1,469,570	1,360,460
Lithuania	1,223,600	1,208,420
Bohemia-Moravia		
Protectorate	21,992	25,220
Czecho-Slovakia		
(Jan. 1, 1939)	469,943	485,374
France		9,872,000
U. S. S. R. (Sheep and goats)		102,500,000
Yugoslavia		10,137,357
Sweden		406,000

The 1939 lamb crop in the United States was 31,867,000 head, about 1% under the record crop of 1938.

Sheep slaughtered in the first 11 months of 1939 under Government inspection in the United States numbered 15,852,332, compared to 16,712,714 in the same period in 1938. (See also LIVESTOCK.) (S. O. R.)

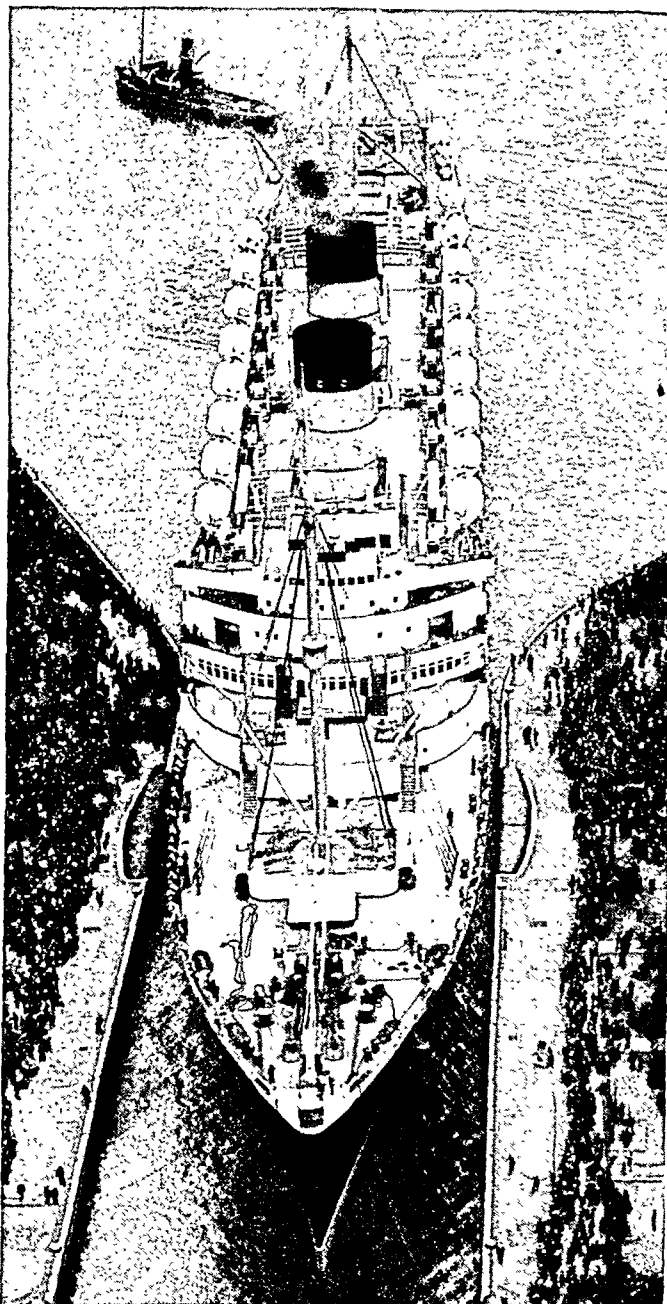
Sherman Anti-Trust Act: see LAW (CASE): Anti-Trust.

Shipbuilding. Like shipping, the whole of the world's shipbuilding in 1939 was influenced by war or anticipation of it. The position at the beginning of the year was varied in the different countries but in comparatively few weeks it was on the stable foundation of rational and natural trade. (See also SHIPPING, MERCHANT MARINE.) (F. C. Bo.)

Lloyd's Register for the quarter ended June 30, 1939, the last full quarter reported before the beginning of the European war, showed that there were 719 merchant vessels of 2,859,292 gross tons under construction throughout the world, the number including only vessels of 100 gross tons or more. This compared with 801 merchant vessels of 2,826,902 gross tons under construction at the same period in 1938. Thus the stimulation of building, the extent being an unknown quantity, has occurred in the last half of 1939.

In the United States, where the picture is clearer, the European war gave added impetus to the greatly enlarged merchant marine program which had been inaugurated by the United States Maritime Commission in late 1937 under the provisions of the Merchant Marine Act of 1936, the purpose of which was to continue the policy of providing for the carriage of a substantial portion of American foreign trade in American vessels.

Under this legislation the commission has projected a building



THE NEW "MAURETANIA," completing her maiden voyage Aug. 6, 1939, became the largest liner ever to use the Port of London by squeezing into her dock with only feet to spare

program of 50 ships a year for ten years, at a total cost estimated at between \$1,000,000,000 and \$1,250,000,000. By the close of 1939, the commission had awarded contracts either directly or in co-operation with private owners for 141 seagoing commercial vessels, involving an expenditure of approximately \$350,000,000 and representing almost a third of the full projected program. During the year ended Nov. 1, 1939, the commission or private owners awarded to private shipbuilders contracts for 118 seagoing commercial vessels with a total gross tonnage of 911,455. The enlarged nature of this program may be seen from the fact that the heaviest building year of the American industry between the World War (1914-18) period and the establishment of the Maritime Commission was 1930, when 214,000 gross tons came from the ways, but of the vessels built in that year, only 15 were of seagoing types. At the close of 1939 American shipyards, including the Government-owned Navy Yards, had under construction about

506,600 displacement tons of Government vessels and 1,122,000 gross tons of sea-going commercial vessels, as well as a large number of smaller naval and commercial craft.

The year consequently has been the most active for the shipbuilding industry of the United States since the World War period, when ships were being produced at a rate never equalled before or since in America or any other country.

Wages in American shipyards in 1939 were at their highest level in the history of the American industry and employment was the largest since the World War. Ship repair yards were more active than in recent years and a strong volume of employment was being maintained.

Events of importance in 1939 included the maiden transatlantic voyage of the "S.S. Mauretania," of the Cunard-White Star Line, the largest commercial vessel ever built in England (although not the largest British built vessel), and the launching at the works of the Newport News Shipbuilding and Dry Dock Company of the "S.S. America," the largest commercial vessel ever built in the United States. It is expected that the "America" will be ready for the service of her owners, the United States Lines, in 1940.

Six yards not previously engaged in the construction of ocean-going commercial vessels opened and received contracts in the United States in 1939, two of them being new organizations and the others having been engaged in ship repairing or the building of small vessels. In the field of research, continuing important results have been developed from model tank tests in Europe and America.

It is of note that the most modern and one of the largest model tanks in the world is now under construction at Carderock, Maryland. This model basin will be used for the study and design of ships and their propellers. It will be available for both Government and commercial work. It is nearing completion and will be placed in operation in 1940.

(H. G. S.)

In Britain, the yards which specialized in naval work were busy but the remainder were in a serious condition; the orders placed during the slight revival of shipping in 1937 had been completed and very few had been secured in their place. The effort to spread the benefit of Government work by placing orders for small naval craft with non-naval yards was not yet showing much effect but the high pressure at which the naval section was working had increased costs in all others, both for labour and material, and a number of British orders were going to Continental yards on the difference in price, which in many motor types amounted to from 10% to 17%.

Dutch and Scandinavian yards were working to capacity, very largely on foreign account, as were also the Germans where more of the facilities of the industry were being released for the domestic demand after bitter complaints. A large number of small craft for the coasting trade and inland waterways were being built and experiments with producer gas engines instead of Diesels, in order to reduce the consumption of imported oil, were proving very successful.

The fishing fleet was also in process of expansion with State assistance. In Italy there was still difficulty in getting the huge State-aided program started in full. In both Italy and Germany naval orders provided much employment. The French yards were greatly hampered by the social laws, especially with regard to the short working week, so that naval work was seriously slowed down and the cost of merchant tonnage became prohibitive without heavy subsidy. (See also NAVIES OF THE WORLD.)

In Japan, beside a huge volume of naval work kept carefully secret, the Government policy kept the yards busy on commercial work to the limit of the available material, but after the subsidy policy had encouraged the building of fast liners and tankers almost exclusively, the shortage of tramps became acute and a

program of standardized designs was started.

Alarm about the serious condition into which the British merchant navy had been allowed to decline brought a promise of Government aid, in the form of grants and loans, for the construction of new tonnage, although passenger liners, tankers and refrigerated ships were excluded. A large number of cargo vessels, both steam and motor, were ordered on the first announcement and although the grants were later withdrawn the Government decided to carry on with the loans when the wider subsidy scheme was held up by the outbreak of war.

A small proportion of the ships ordered were designed for regular service but the majority were tramps in the neighbourhood of 9,000 tons deadweight and the number of "handy-sized" tramps was disappointing. Conspicuous favour was shown to the standardized designs which a number of yards had worked out for the sake of economy, and both steam and Diesel machinery was generally of comparatively simple design, few of the more elaborate economizing devices with heavy patent royalties being installed. Except for a few tankers on Norwegian account and still fewer first class tramps for the Greeks there were no foreign contracts and the number of coasters ordered in Britain was not to be compared with the number of contracts which went across to Holland.

When war broke out, and the German submarine campaign was immediately launched against British and French commerce, there was naturally a complete change throughout Europe, in neutral countries as well as the belligerent States, but most of the details were kept carefully secret and only a few were released by ministers and others. Shipbuilding and repairing were brought under strict Government control, for national benefit. In Britain that side was put under Sir Amos Ayre, a practical shipbuilder who had made his reputation with the design and construction of "economy" cargo ships of the simplest and most efficient type, which was the principle most favoured for rapid output and reliability when the engine-room personnel was certain to be of varied quality.

It was soon announced that there was no intention of following the standard ship policy of the World war, when all the yards were made to scrap their individual plans and to work to a few Government designs, and it was planned to secure the most rapid delivery of the simplest suitable types by making the greatest use of the individual policy of each yard and engine works. This policy produced most satisfactory results and there was soon a steady stream of merchant ships being delivered. (See also BLOCKADE; SUBMARINE WARFARE.)

In all the belligerent countries, a large proportion of the shipbuilding resources normally used for mercantile work naturally had to be diverted to naval purposes; in Britain and France because the war against commerce demanded very large numbers of patrol, escorting and minesweeping vessels which were best built at the commercial yards and in Germany because the projected fleet of submarines, especially small minelayers, was far beyond the powers of the few yards which had specialized in their construction before the war.

Italy, Holland and Denmark, with plenty of work on order, were handicapped by the difficulty of getting materials, and Spain, starting a big effort to repair the damage done by the Civil War, of getting machinery and fittings.

Outside Europe, Australia, which had planned a shipbuilding industry for years to go with her increasing steel output, launched it with Government bounties, Japan relaxed her very expensive efforts when the ships formerly on European service returned home and the United States, owing to the workings of the Neutrality Act, were content for the time with the pre-war program of the Maritime Commission.

(F. C. Bo.)

Shipping, Merchant Marine. United States.—The most important development in American shipping since the World War occurred in the fall of 1939 when a special session of Congress, convened by President Roosevelt because of the European war, adopted the Pittman Neutrality Act which barred American ships, American citizens and American seamen from travel to belligerent ports or in combat areas. After a short period of readjustment most of the affected steamship lines found other work for vessels which were thus prohibited from operating in their normal services.

The permanence of these substitute operations and the extent of the hardship which they involved was not immediately ascertainable. (See also NEUTRALITY.)

Leaving out of consideration the neutrality problem which was one of supreme national importance, to be decided on the basis of the welfare of the entire people rather than of the segment represented by the shipping industry, the year 1939 was a relatively successful one for American ship companies and for shipping as a whole.

The American President Lines, Ltd., (reorganized Dollar Steamship Lines) went into full operation with fortnightly sailings in the round-the-world service, and likewise in the transpacific service, spaced so that there was a weekly sailing of American-flag vessels across the Pacific. The Lykes Bros. Steamship Co. lines out of the Gulf were forced to curtail their service during the year because of a decrease in business with Germany, but toward the end of the year resumed their previous activities, using all their ships.

The Government-established American Republics Line from New York to the east coast of South America had a most successful year, and with the increased emphasis on Latin-American trade and co-operation, gave promise of still greater prosperity. The line runs from New York to Rio de Janeiro, Santos, Monte-

video and Buenos Aires. Success of the passenger service inaugurated at the end of 1938 was believed due in part to the speed and attractiveness of the three liners, "Argentina," "Brazil" and "Uruguay," which were luxuriously equipped for the South American trade. The freight service of the Good Neighbor Fleet operated by the American Republics Line also showed encouraging gains.

One new steamship service was established, the Puget Sound-Orient Line, operated for the account of the United States Maritime Commission. This provided cargo sailings from Pacific Northwest ports to the Orient, which had not been available under the American flag since the American Mail Line withdrew its ships in Aug. 1938.

The Puget Sound-Orient Line was begun with cargo vessels on an experimental basis, with the prospect of introducing combination passenger and cargo ships as soon as some now building are completed.

The services to Spanish ports which had been discontinued during the Spanish Civil War were resumed by the American Export Line and Lykes Bros. Steamship Co. This involved merely the addition of Spanish ports of call to the established service. Late in the year the Maritime Commission chartered three of its shipping lines, the American Hampton Roads-Yankee Line, the America France Line and the Oriole Lines to United States Lines company. The lines operated in the transatlantic trade and 16 vessels were covered in the charter. Introduction of new, fast freighters was contemplated for all three lines. American flag trade from the Gulf of Mexico to the Orient practically disappeared because of the difficulty of obtaining cargoes out-bound to China or Japan, but was later resumed.

American steamship lines began to offer substantially improved service with new ships being built under the Maritime Commission's construction program. They provide, particularly, efficient cargo handling equipment, economical operating costs and increased speed. Twenty-five of these had been launched by the middle of October and were to be in service by the close of the year 1939. Several were placed in service on the Moore-McCormack Lines Scantic service to Scandinavian and Baltic ports. The 12 high-speed tankers which were built by the Standard Oil Company of New Jersey, with the Maritime Commission paying the cost of national defence features, including the cost of providing the additional speed above normal tanker requirements, were so successful that three were purchased by the Navy and two by the Keystone Tankship Corporation of Philadelphia. One was placed in service by the Standard Oil company from New York to Aruba, and two in the coastal service.

The "America," largest commercial ship ever built in an American yard, was launched August 31 under the sponsorship of Mrs. Franklin D. Roosevelt.

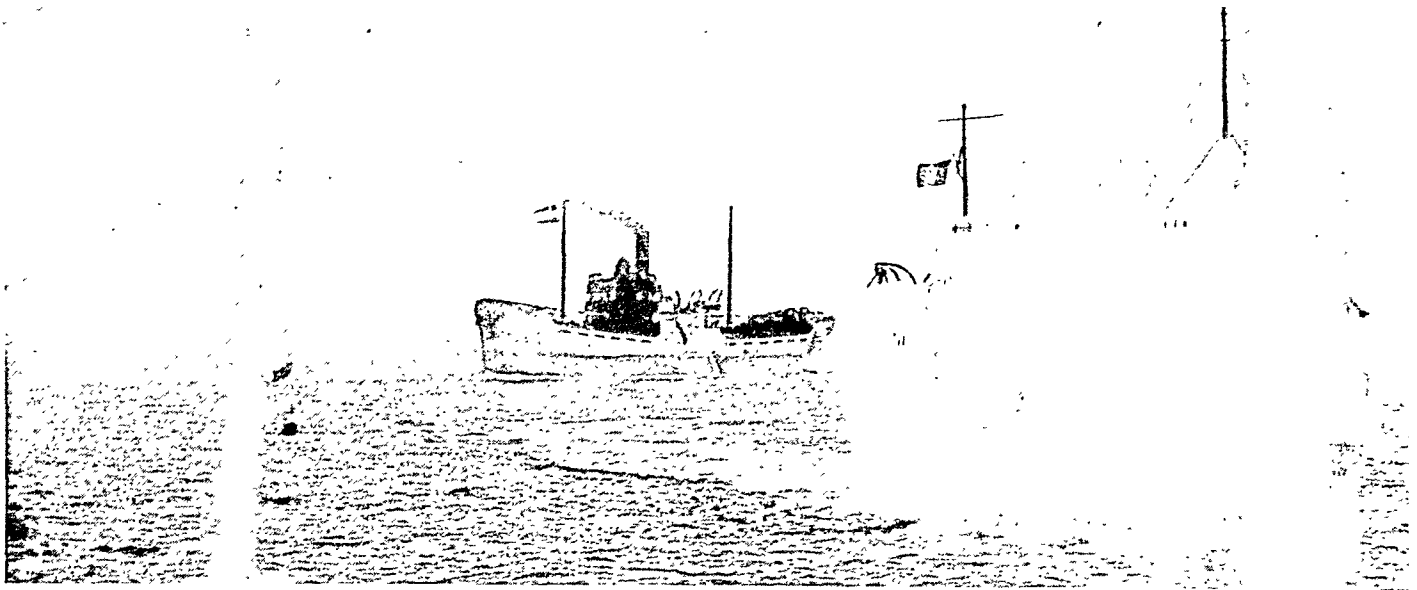
The commission's construction program was subsequently accelerated so that orders planned for 1940 were in many cases issued in the fall of 1939. By the middle of October, there were 139 ships ordered, of which 25 had been launched.

The C-2 type vessels launched by the commission proved in trials to be among the most efficient of their class in the world. The commission's construction program included a large number of Diesel propelled vessels, marking the first time Diesel propulsion had been given adequate recognition in American shipyards.

Freight rates were steady until the outbreak of the European war when sharp advances occurred due to increased hazards of operation and increased operating costs, such as war risk insurance and the requirement for higher compensation to crews.

GERMAN CREW MEMBERS leaving the burning "Columbus" after the luxury liner was scuttled 450mi. off the U.S. coast Dec. 19, 1939, to avoid capture by a British destroyer



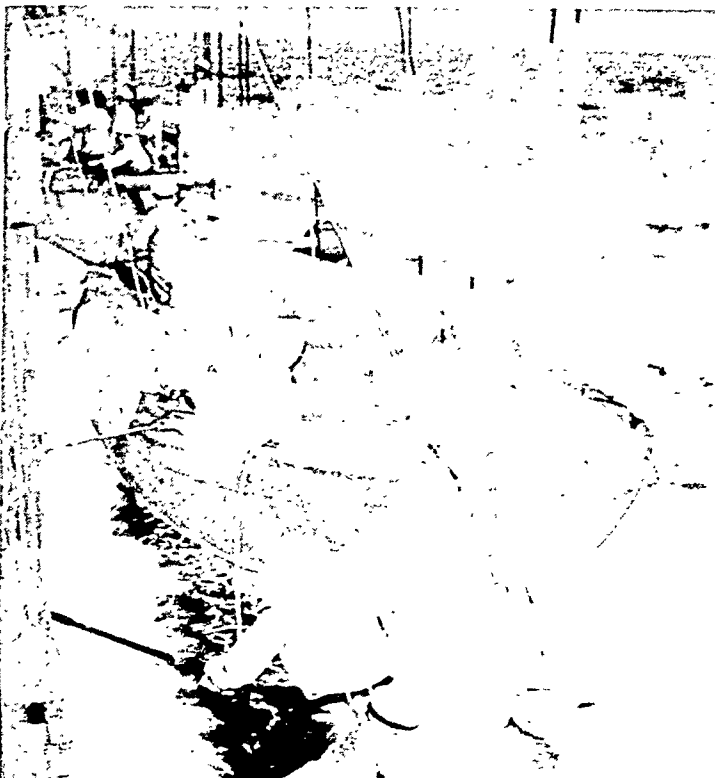
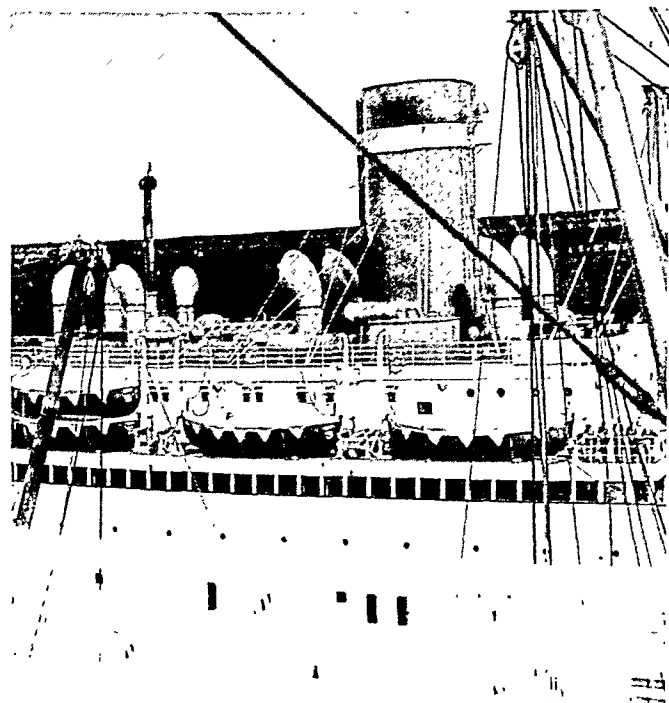
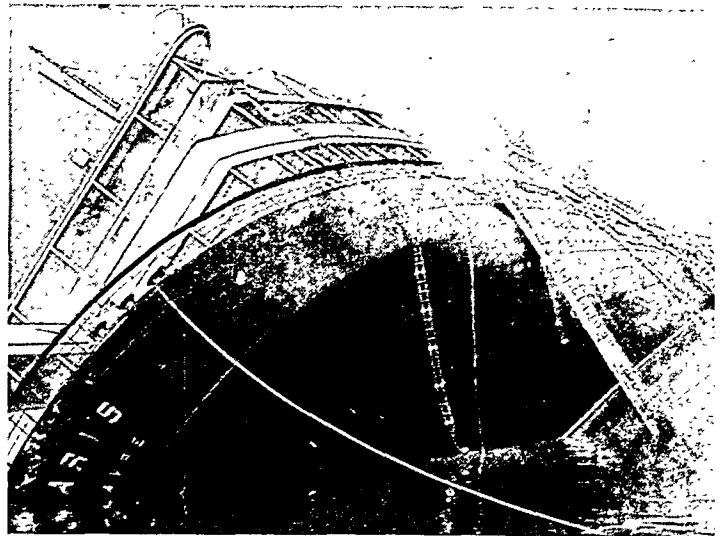


Above: BRITISH MERCHANTMEN steaming closely together with naval convoy in 1939

Right: S.S. "PARIS" of the French line keeling over at Le Havre Apr. 19, 1939, after being destroyed by fire of unexplained origin

Below, left: AMPLE IDENTIFICATION for submarines was painted on the sides of the U.S. liner "President Roosevelt" before it sailed for Europe Sept. 6, 1939

Below, right: TO AVOID DETECTION BY BRITISH SHIPS, the "Bremen's" crew painted the ship a dull grey during its mysterious voyage from New York to Murmansk to Germany, where it arrived on Dec. 12, 1939



The chartering market was fairly active during the entire year, particularly during the last few months. There was a decided demand for tonnage on time and net form and also on a lump sum basis. Charter prices rose from 300% to 500% and gave promise of rising further if there were continued losses of tonnage from torpedo and mine warfare.

The movement on the Great Lakes was the heaviest in years, due largely to expanded operations of the steel industry. The trade consisted of iron ore from the head of the lakes to Lake Erie and coal on the return voyage, with some carriage of package freight. Coastwise and intercoastal ship traffic was poor during the first half of the year, but improved during the second half. This development was normal.

The Maritime Commission made substantial progress in its training program for licensed and unlicensed seamen, the United States Maritime Service, with the commissioning of the training ship, "American Seaman," and with the establishment of training stations at Hoffman island, New York, Government island in San Francisco bay, and Fort Trumbull, Connecticut.

The European war caught thousands of Americans abroad and passenger facilities on returning ships were insufficient to meet the tremendous demand.

Cots were set up in the public rooms of liners. Freight ships brought passengers far beyond their ordinary capacity. The Maritime Commission arranged the charter of five coastwise vessels for the sole purpose of repatriation.

The demand for space on American ships was increased when the British liner "Athenia" was sunk with many Americans aboard. The Government freighter "City of Flint," operated for the Maritime Commission's account, picked up 221 survivors of the tragedy and made a remarkable voyage to Halifax. With ordinary accommodations for 29 passengers and 40 crew, Capt. J. A. Gainard provided bunks and food for 290 persons.

In the early months of the war American ships and American seamen displayed heroism and seamanship in participating in the rescue of more than 800 persons who were victims of marine disasters resulting from belligerent activity. (See also EXPORTS AND IMPORTS; INTERNATIONAL TRADE; SHIPBUILDING; TRADE AGREEMENTS; UNITED STATES: *History*.) (E. S. L.)

European Shipping and the War.—Merchant shipping for the whole of 1939 was naturally influenced by the war which broke out in September, for in spite of the Munich agreement the world was obviously heading towards war and while all possible efforts were being made to avoid it, every country had to take precautionary measures which involved shipping; all

mercantile plans for the future had to be made with the possibility of war in view.

The war risk added to the expenses of the shipowner and disturbed the marine insurance market long before the war started, especially when huge quantities of gold were sent to the United States in shipments—up to £12,000,000 in one vessel—which were quite unjustified in ordinary commerce, and often in unsuitable ships.

This nervousness of approaching trouble was naturally against the interests of shipping, for the traffic for the purpose of rearmament was purely artificial. Ordinary business enterprise was checked and freights were generally low.

The tramping section was particularly hard hit, for the tendency was to ship in smaller parcels by liner. Practically all owners showed a decline in profit in their reports and had to reduce or pass their dividends.

The International Committee tried to maintain the policy of freight co-operation in spite of obvious signs of crumbling. For a time they had some success, but in consequence of the British Government favouring British ships to carry the war-time reserve of grain from the River Plate when Greeks were next on the agreed roster for employment, the Plate Minimum Freight scheme collapsed and it was realized that international agreement was practically ended until conditions were radically altered. Competition was therefore intensified and matters were made worse by the release of most of the remaining ships' time chartered during the 1937 revival, by the paying off of a number of ships, mostly Scandinavian, which had been employed by the Japanese in the campaign in China and by the collapse of the Government party in the Spanish Civil War.

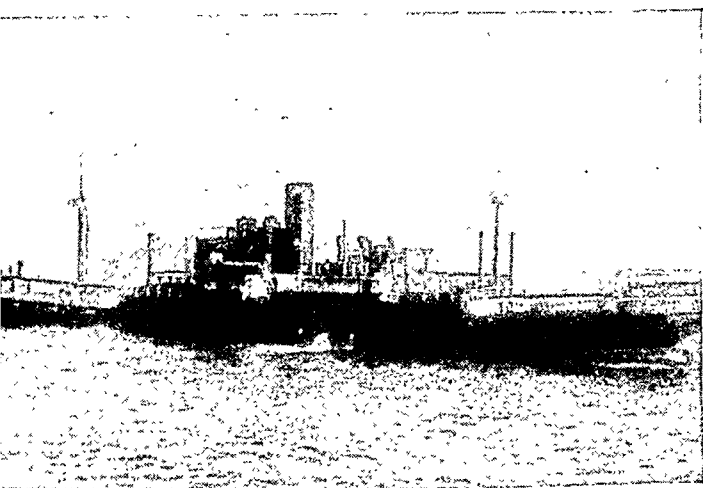
The possibility of war naturally greatly increased the grave concern already felt in Britain at the decline of the merchant service and seagoing personnel. The shipping industry, through the Chamber of Shipping, issued a very careful statement of the causes of the decline of each section, and suggestions for rectifying matters with the help of the State. The sections which supplied this information were the deep-sea tramps, the deep-sea and near-trade liners, the near Continental traders, the coasting tramps and the coasting liners; the owners of tankers failed to agree among themselves and desired further discussions with the Government.

These reports and suggestions were considered by the authorities who announced the general principles of their plans in March and introduced the British Shipping (Assistance) Bill at the end of July, to come into effect at the beginning of 1940. It provided for a subsidy not exceeding £2,750,000 per annum for deep-sea tramps for five years, and assistance to liners suffering from the competition of subsidized foreign rivals, each case to be considered on its merits.

Tankers and coasters were excluded, the former for lack of suggestion and the latter on account of their competition with the railways. Assistance in the ordering of new tonnage was to be in the form of grants and loans on generous terms, but passenger ships and refrigerated foodstuffs carriers were excluded. The measure was abandoned at the outbreak of war but the shipbuilding sections were honoured as so many ships had been ordered when they were announced in Parliament.

In addition to monetary help the liner and near Continental sections suggested that the fair claims of British shipping should be pressed when trade treaties were being arranged as these had frequently resulted in the shipping of the other country concerned carrying all or nearly all the goods exchanged.

Alongside the move towards State aid the owners and authorities co-operated in measures to keep the ships running in war-time and to defend themselves from attack. The normal sea-going per-



THE FIRST BRITISH MERCHANTMAN sunk in the European war was the "Bosnia," torpedoed Sept. 5, 1939, off the Scottish coast



"YOU HAVEN'T SEEN THE BREMEN AROUND, have you, Bill?" Cartoon by Fitzpatrick of *The St. Louis Post-Dispatch*

sonnel, especially after Royal Naval Reservists had been withdrawn for naval work, would obviously be insufficient when laid-up ships were commissioned and early in 1939 the Mercantile Marine War Services List was established. This was a register of trained seamen of all grades who had left the sea for work ashore and who were willing to return to it. Officers had already gone through the Admiralty's courses on handling their ships in war in large numbers; now the scheme was extended to short courses in gunnery, etc., for the other ranks.

A War Risk Insurance scheme was put into operation by British underwriters in March and although some amendments in detail were immediately necessary it worked well; in April the Government announced its intention of undertaking the re-insurance of the risk.

The sale of British ships, especially tramps, to foreign interests when they could no longer be made to pay under the British flag had also been causing concern and after a period of official discouragement of the practice it was decided that in order to build up a war-time reserve of tonnage, the payment of State aid should be made dependent on owners who had tonnage to sell, giving the Board of Trade the first refusal. When war broke out only four ships had been acquired.

Other countries were also interested in schemes for State aid. In the United States the policy of differential payments, based on the greater building and running costs of American ships as compared with those of practically every other nation, was found to work excellently after weathering a good deal of criticism and it is probable that the nation has got a better return from it than from any previous subsidy scheme. Several of the maritime powers which have previously been against any form of State aid to shipping were being forced to reconsider their position before the outbreak of war, and Germany, Italy and Japan only revealed part of the assistance that was given, since merchant shipping matters are regarded in those countries as being as secret as those of the navy. As part of the reorganization of the American subsidy scheme a number of assisted services have

been offered for sale, but only a few have found purchasers.

In the earlier months of the year there was a strong renewal of the British demand that shipping affairs should be taken out of the hands of the Board of Trade and administered by a Ministry of Shipping concerned with nothing else. This demand was strengthened by the Government action which caused the collapse of the River Plate minimum freights scheme and some incidents concerning the transfer of British ships to foreign flags, but no action was taken until some time after the outbreak of war, when the post of Minister of Shipping was made a political one and nearly all the personnel was drawn from the Board of Trade, with practical shipping men as advisers only.

When the situation became critical British and French liners on yachting cruises were recalled by wireless, mail and passenger sailings were cancelled to satisfy the authorities' demands for auxiliary cruisers, transports and the like, cargo vessels were taken up by the score for war purposes and the plans for utilizing merchant ships in war, although not properly framed until a few months before they were wanted, worked with far less waste and inefficiency than in 1914. All German ships were ordered by wireless to seek shelter at once and special care was taken to get the little short-sea traders into home waters to act as supply ships in the Baltic. The withdrawal of most of the allied passenger liners from the transatlantic service at the height of the American tourist season was particularly awkward and the large number of holiday-makers wanting to get away from Europe was further handicapped by American ships, including some big coastal liners chartered by the U.S. Government, being delayed by disagreement with the seamen as to terms. Some cruising yachts were pressed into service and neutral ships were naturally packed to capacity.

In Britain all shipping came under the control of the Admiralty at once. The Mediterranean was closed to British shipping for a time owing to the uncertainty of Italy's attitude and merchant ships were temporarily held up in neutral ports in areas where there was known to be special danger. The convoy system was started without delay, although at first it was hampered by lack of naval material which forced fast and slow ships to be grouped together and also caused excessive delays. The results were excellent with regard to the safety of the ships; after three months of war 81 British ships of over 305,000 tons gross had been sunk by enemy action, beginning with the "Athenia" on the first day of the war, but of those under convoy the proportion was less than one in 750. The defensive armament of merchant ships was also most effective, although ships so armed were regarded by Germany as warships in spite of all neutral nations acknowledging their rights and Germany herself having done so in the past. (See also SUBMARINE WARFARE.)

There was a great movement to buy shipping shares on the recollection of the profits made during the war of 1914-18, but in British ships freights were strictly regulated from the first, and although the inelastic "Blue Book" system of 1914 was avoided they were soon far below those obtained by neutrals, and running costs naturally rose rapidly. To make the most of the cargo space available a system of licences for all overseas voyages was immediately introduced, worked by voluntary committees of shipping men, and this was later extended to the coasting trade also.

The diversion of a large proportion of the shipping of the British east coast ports to the west as a measure of precaution against air attack caused less confusion than had been anticipated, but there was an inevitable demand on the coasting services to relieve land transport in the distribution of imports and the Dutch motor vessels which had become a big factor in British waters were withdrawn at once although many of them, especially those built for owner-skipper on deferred payment, were soon offered for sale on the insistence of the mortgagee banks.

Although German enemy action by surface raider, submarine and mine caused heavy losses to British, French and Polish shipping, the losses among neutral ships were particularly heavy, especially after the beginning of the German policy of sowing international waters with the new magnetic mine which claimed many neutral ships with heavy loss of life. A number were also torpedoed, both when bound for allied ports and also when on blameless voyages from one neutral port to another. Generally speaking the blockade by German surface ships in the Southern Baltic and the Belts was legal, the ships being sent in to port for search and prize court proceedings, but when a prize crew from the battleship "Deutschland" took the American steamer "City of Flint" into a neutral Norwegian port the United States authorities made a strong protest while the Norwegians released the ship and interned the prize crew. (See also BLOCKADE.)

While a certain number of neutral ships, partly on account of the risk and partly the heavy cost of insurance and manning, were laid up, the majority of them continued to run on a rapidly rising market. The Italian liners "Rex" and "Conte di Savoia" were the only first-line ships to remain on the North Atlantic service and they reaped a rich harvest with increased fares. The "Normandie" and "Queen Mary" were tied up in New York, the "Europa" in Germany and the "Bremen," after finding shelter for some weeks in Russian waters, also returned to a German port.

In spite of the big Government building program that was immediately put in hand, the British merchant navy proved as inadequate for war needs as had been feared for some years past, and a number of neutral ships, mostly Greeks, were taken up on time charter while others were employed on ordinary voyage charter on the open market. The United States Neutrality Act, debarring American ships from a large part of western Europe, threatened the owning firms with immediate destruction of the valuable business that they had built up with so much care and resulted in a number of Scandinavian ships, mostly fast cargo liners, being chartered. (See also BALANCE OF TRADE; EXPORTS AND IMPORTS; INTERNATIONAL TRADE; NEUTRALITY; SPAIN, CIVIL WAR IN; SHIPBUILDING; STRATEGY OF THE EUROPEAN WAR; UNITED STATES.) (F. C. Bo.)

Shock Treatment: see MEDICINE; NERVOUS SYSTEM; PSYCHIATRY.

Shoe Industry. Four months of war in 1939 changed the world economics of shoes and leather—accelerated the use of more heavy shoes and leather and affected world supply and prices materially. The normal eight months of 1939 indicated a rising manufacture of shoes in every country. Intense nationalism found expression in shoemaking and shoe wearing as a symbol of "buy at home."

World Trading.—Leather is actually a "short" world commodity, a by-product of meat and not subject to the theory of "surplus" economics. It therefore commands a world price. The United States is the world's largest producer and consumer of leather and also the largest importer of hides and skins. Normally, a quarter of a million hides and skins are imported every working day of the year into the U.S.—99.9% kidskins, 50% sheepskins, 25% calfskins, 15% cattlehides and 100% kangaroo, lizard, crocodile, shark, etc., for the industry. War has disturbed trade routes and foreign supplies to practically every country on the globe. As a consequence, the supply and price factors are flexible to events on the seas. For example, hides from the Argentine (the world's great supply source) and kid skins from China actually trickle into Germany through neutral countries.

World Production.—World (machine made) production in 1939 exceeded the estimated manufacture of 1938. Machine made

production amounted to 1,183,000,000 in 1939—(Europe, 505,000,000, North America, 515,000,000, South America, 60,000,000, Asia and Oceania, 75,000,000 and Africa, 28,000,000). Native handicraft also increased the world over.

Utilitarian and work shoes increased materially, though the previous trend was towards style and novelty footwear. Regimentation and rationing of footwear may accelerate the heavy construction in 1940. Nevertheless, whims of women manifest themselves, and 25,000,000 pairs of elasticized-upper shoes were made in the United States in 1939—which, only three years ago, were an unknown type. In war-free lands the expression of style in men's shoes was significant of masculine dress change.

Rubber Footwear.—Expansion of rubber boot and shoe manufacturing was evident in 1939—war and "decontamination" civilian wear in Europe; cheap rubber shoes (canvas topped) for peasant and native wear in Asia and Africa; and sport and play shoes (tennis type, sandals, platforms) increased in war free lands.

Controls and Marking.—World rubber supply is subject to economic rationing by Great Britain; Australian and Indian skins are marketed with British Government controls, Argentine hides are export-managed, and leather is listed as a contraband, by warring nations. Trade barriers, reciprocal agreements and nationalistic controls were revised in late 1939 to include materials in shoe construction but the movement of machinery—mostly from United States—for shoe manufacture is almost universally favoured under regular tariffs. (A. D. An.)

Shows. **Horses.**—War in Europe took a noticeable portion of colour and public interest from the principal horse show in the United States in 1939. Only two foreign army teams, those of Mexico and Chile, competed in the eight-day exhibition of the 54th National Horse Show, Nov. 4–11, 1939, at New York. British, French, Irish and Canadian army teams, which had added to the interest in previous shows, were absent in 1939. The 1939 honours were divided among the Mexican, Chilean and United States army teams. Capt. Misael Mariles, Mexico, won the Bowman Challenge Trophy, and his colleague, Capt. Ramiro Palafox, won the Military Special Challenge Trophy donated by Whitney Stone. The Chilean team, composed of Maj. Eduardo Yanez, Capt. Armando Fernandez, Capt. Pelayo Izurieta and Lt. Hernan Vigil, won the three-day, low-score competition for the Arturo Alessandri Trophy. Capts. Fernandez and Izurieta tied for first in the International Individual Military Championship. The United States army team, Capt. Royce A. Drake, Capt. Carl W. A. Raguse, Lt. Franklyn F. Wing and Lt. Frank S. Henry, won the International Perpetual Trophy for military teams. Capt. Drake and Lt. Wing tied for the \$1,000 Military Stake.

The largest prize at the National Horse Show, \$2,000 for three-gaited saddle horses with a natural tail and over 14-2, was won by Clearview Maybelle owned by Mr. and Mrs. Geo. C. Mahoney. This prize, for horses with natural tails, attracted considerable comment by newspapers and the American Society for the Prevention of Cruelty to Animals, at the 1938 show in New York when it was won by Strolling Bye, owned by Mrs. Reed A. Albees. Strolling Bye, which appeared in the 1938 show with a natural tail, was entered in the 1939 show with a set tail.

The American Horse Shows Association, Inc., which has jurisdiction over leading shows in the United States reported 187 recognized shows in 1939 compared to 174 in 1938. The association reported that six shows had resigned membership for 1940. Among these was the Atlantic City, N.J. show, which suspended for lack of public interest. The association's jurisdiction refers chiefly to the larger city and State shows and does not include the small local and county which number several thousand annually in the United States. The association announced re-

ceipts for 1939 as \$14,226; expenses, \$17,708. The deficit of \$3,482 was made up by private contributions. (S. O. R.)

Dogs.—The year 1939 closed with around 302 dog shows. The cocker led in registrations and was the fashionable dog of the day. Other leading breeds in order of registration were the Boston, beagle, Scottish terrier, wire-haired fox-terrier, Pekingese, dachshund, springer, chow chow and greyhound. The largest show of the year was the Morris and Essex at Madison, N.J., with 3,862 dogs actually on the benches. (W. Ju.)

Livestock.—Heading the list of national livestock shows for 1939 was the 40th International Livestock Exposition and Horse show which was held from December 2 to 9 in the International Amphitheatre at the Chicago stock yards. Stockmen from 34 States and Canada exhibited 13,322 head of beef cattle, horses, sheep and swine. The 33rd National Western Stock show, first in calendar position among American national shows, was held in Denver, Colo. January 27 to February 4. It is noted for its exhibitions of feeder cattle and beef bulls which are shown, judged and sold in carlots.

Another early show, and the oldest in the United States, is the Southwestern Exposition and Fat Stock show at Ft. Worth, Texas. It celebrated its 43rd annual renewal March 10 to 19, 1939. The Eastern States Exposition at Springfield, Mass., a late summer show founded in 1917, accents dairy and beef cattle competitions. It was held September 17 to 23. A similar exposition in the West is the Pacific International at Portland, Oregon. It was founded in 1911 and was held Oct. 7 to 14, 1939.

A series of national shows, featuring, in turn, beef cattle, horses, swine, sheep and dairy cattle, was held during 1939 in connection with the Golden Gate International Exposition at San Francisco. Cash prizes totalling \$266,980 were offered in the five divisions which took place at intervals from February 18 to October 30. The final feature was the National Dairy show, which was founded in Chicago in 1906 and in later years became an itinerant show. Its San Francisco dates were October 21 to 30. Dairy men and Belgian draft horse breeders stage a combined show each year at Waterloo, Iowa, known as the Dairy Cattle Congress and National Belgian Horse show. The 30th Congress was held September 25 to October 1. The American Royal at Kansas City, Mo., is noted for its outstanding horse shows and beef cattle exhibitions. The 40th Royal was held October 14 to 21. Important livestock shows were also featured at nearly all of the State fairs during the summer and early fall months.

Canada's two leading annual livestock shows are the Canadian National Exposition and the Royal Agricultural Winter Fair, both of which are held in Toronto. The Canadian National, founded in 1879, was held August 25 to September 9. The 18th Royal Winter Fair was scheduled for November 21 to 29 but was cancelled on account of the war. The big livestock exposition of South America is the Palermo show, held annually in Buenos Aires in August. It usually runs about ten days, no definite closing date being scheduled. The Palermo show is particularly noted for its huge showing of Shorthorn cattle, attracting each year the largest display of this breed in the world.

Great Britain's two leading all-breed shows are the long-established Highland show of Scotland and the Royal of England. Both are itinerant. The 108th Highland show was held in Edinburgh June 20 to 23; and the 98th annual Royal show took place in Windsor July 4 to 8. (W. E. O.)

Siam (Thailand). Area 200,148 sq.mi.; pop. (census 1937) 14,650,000. Chief towns: (pop. 1937) Bangkok (cap. 681,214); Chiangmai (544,001); Khonkaen (473,475); Chiangrai (443,476). Ruler: King Ananda Mahidol; language: Siamese; religion: Buddhism.



PRINCE ADITYA DIRABHA, regent of Siam, affixing the royal seal on a decree which officially changed the name of the kingdom to Thailand on June 24, 1939.

History.—Siam, which at the end of May announced her change of name to "Muang Thai" ("The Land of the Free"), continued to maintain her neutral independence during 1939 and, in face of the European war, proclaimed her strict neutrality within three weeks of its outbreak, and proceeded with her land, sea and air rearmament. A plot revealed in January for the replacement of the young King Ananda Mahidol by the former King Prajadhipok (now Prince Sukhodaya), or by another uncle, Prince Nago Svarga, and the consequent cashiering of a number of army officers, had no effect on the peaceful progress of the country, the development of which is proceeding on well thought out lines, especially in road-construction and irrigation. Though the capital, Bangkok, now one of the most important air-route centres in Asia, suffered through a serious fire in August, damage estimated at over £90,000, progress has been made with its new port; and by encouraging the co-operative credit movement and issuing an internal loan of 25,000,000 baht the Government has done much to improve the lot of the peasants.

Following the treaties successfully concluded with various foreign powers in 1938, a number of new laws affecting trade were passed, and the sale and manufacture of oil (the refining of which is a Government monopoly), salt and tobacco are now controlled. Large changes in the finances were made during 1939; the capitulation tax and taxes on sugar-cane and tobacco plantations with other land-taxes and those on houses and shops were replaced by a re-organization of excise duties and other special revenue, the balance being slightly against the treasury. Also, the beginning of the financial year was changed from April 1 to October 1.

(L. H. D.)

Education.—In 1936-37: elementary schools 8,983; scholars 1,151,915; secondary schools 206; scholars 42,225; special schools 2,984; scholars 33,087; universities, number of students enrolled 11,525.

Banking and Finance.—Revenue, ordinary (est. 1939-40) 109,425,940 baht; expenditure, ordinary (est. 1939-40) 109,397,988 baht; expenditure, capital (est. 1939-40) 22,108,524 baht; public debt (Mar. 31, 1938) 80,593,000 baht; notes in circulation (June 30, 1939) 151,000,000 baht; exchange reserve (June 30, 1939) 127,000,000 baht; gold reserve (June 30, 1939) 18,000,000

baht: exchange rate (approx.) 11 baht=£1 sterling.

Trade and Communication.—Foreign trade 1938-39; (merchandise): imports 123,575,000 baht; exports 173,078,000 baht. Communications: roads, State highways completed (1938) 1,815-mi.; railways, open to traffic (1938) 1,925-mi.; airways, length of route opened (1938) 444-mi.; motor vehicles licensed (1937-38): total 11,439 (cars 5,910; trucks 4,233; buses 146; cycles 559); wireless receiving set licences (1938) 29,834.

Agriculture and Mineral Production.—Production: (in metric tons), rice (1938) 4,937,400; rubber (1938, exports) 42,000; tin ore, metal content (1938) 14,000; soybeans (1937) 9,721; tobacco (1937) 8,033; cotton (1937) 7,083; maize (1937) 5,025. (W. H. WN.)

Siberia: see UNION OF SOVIET SOCIALIST REPUBLICS.

Siegfried Line. Germany's Siegfried Line or "Westwall" is that nation's answer to France's eastern border fortifications, the main elements of which were completed in 1934 to bear the name of the Minister of War during whose regime they were commenced—André Maginot.

Begun in 1937, Hitler (May 1938) pronounced the Siegfried works "the most gigantic fortress in the world," embodying, in the advanced zone, no less than 17,000 concrete forts, these supported in rear by from three to four additional lines of defence. Completion of the whole by the winter of 1937-38 was predicted, but it is recorded that when the Fuehrer visited Kehl in Sept. 1938, to inspect the progress thus far made, he nearly wept with disappointment. Roundly castigating the Prussian officers who accompanied him, he summoned Germany's ace roadbuilder, Dr. Fritz Todt, and instructed him in no uncertain terms to increase without delay the tempo of the entire effort. Within a brief space thereafter, 500,000 additional workmen had been assembled for assignment to the task, and shortly some 278,000 of these were pouring concrete at scattered points along the line.

Following quite closely the windings of Germany's western frontier from Switzerland (opposite Basel) to a point facing the Dutch border approximately 60-mi. north of Aachen, the key points in the Westwall include the rebuilt Isten fortress opposite Mulhouse, the fortifications around Kehl (just east of Strasbourg), the Saar forts, and the defences of Cologne. In the Kehl sector especially, observers report "pillboxes" so numerous that they appear to be located no more than room. apart: indeed the number of these strong points along the entire 150-km. where the Rhine forms the international boundary is notably greater on the German than on the French side. And while the French have placed their works, in general, from 7 to 10-km. distant from the boundary proper, the German emplacements, when not actually contiguous to it, are usually not far removed.

While the measures taken on the German side to delay and nullify tank attacks are similar in scope to those employed by the French, they differ in certain details. Thus, although barbed wire entanglements are common to both, as are blind ditches and other terrain obstructions, the Germans rely on thousands upon thousands of small pyramids of concrete, projecting to unequal heights from the surface of the ground, to bring grief to mechanized vehicles, whereas the French favour the installation, in comparable positions, of equal numbers of steel rails set vertically in the earth, again with their free extremities rising for varying distances above the sod. It likewise appears that, while employing, in part, underground beehives similar to those of the French, they have not burrowed so deeply nor built as massively as have their enemies. Thus a German artist's sketch of one of their blockhouses reveals but three levels (as against seven in a comparable unit of the Maginot line). The uppermost of these is no more than a small

cupola set atop a lower one of materially greater dimensions, the floor of which is at ground level. The single subsurface gallery depicted houses the inevitable electric tramway for communication with other strong points, and with the rear.

The roof of the crowning cupola (which houses personnel engaged in observation and communications) appears to be three or more feet thick, while that of the huge mushroomlike edifice beneath, the west-facing elements of which contain guns and their crews, the remainder, quarters and utilities for officers and men, seem fully as thick again. Even a density of six feet, however, is only just sufficient to protect against a shell of 250-mm. calibre, so it is evident that these works are not designed to withstand the fire of guns of over 10" bore. But being as they are, so numerous, and so relatively small by comparison with many of the French underground fortresses, it may be assumed that the Germans have concluded (probably wisely) that no enemy would waste the effort of super powerful artillery upon any one of them.

The scope of these fortifications has been described in the German publication, *Der Angriff*, as follows: "There is a front line of steel and concrete pyramids running like a road over hills and down valleys from the northern to the southern extremity of the Western Border." Behind this lies . . . "a secondary line of ferro-concrete forts largely sunk into the ground and practically invisible to the naked eye." Reports indicate that behind the works just described lie chain after chain of machine gun nests. These are not, however, necessarily interconnected by networks of subterranean passages, for the German high command does not favour an entirely underground system as do the French. Rather does it share its favours between works above ground, but very heavily camouflaged, and those below, restricting these, however, as already indicated, in both size and scope.

Closely linked with, and parallel to, the Westwall defence system is an "Air Defence Zone"—separated from it by distances varying from one to several kilometres, then extending eastward to a depth generally greater than that of the Westwall itself. Here lie myriads of anti-aircraft gun positions, deeply echeloned and, like the front lines, heavily camouflaged. Supplementing these are kite and balloon barrages, so-called "mine fields of the air." The entire zone is covered with a network of observation posts, with telephone connections, prepared to notify neighbouring anti-aircraft batteries and the headquarters of fast pursuit squadrons of the approach of hostile planes.

Not only is anti-aircraft defence provided (and this is flexible, as well as stable since, in addition to permanent emplacements, many motorized field batteries are available) but, if we can give credence to an article in *Die Wehrmacht* (Feb. 1, 1939) by Lieut. General Kitzinger, zone commander, the area appears literally to constitute a second Siegfried Line. He says in substance: "All parts of the Western Air Defence Zone are protected by armour and reinforced concrete. An enemy attacking this terrain strikes, after penetrating the army zone (Westwall), tank obstacles, road obstructions, and a united front of ground defences which at several points are echeloned to a depth of several kilometres. . . . The zone as developed is a powerful element in the framework of West Front defence. The ground works are of great depth, while in the air is a blockade stronger and more extensive than any has ever been. The countless anti-aircraft batteries and pursuit squadrons protect not only the operations zone of the army; they are above all an effective defence for the populace and industry of great areas of our land." (See also EUROPEAN WAR; LIGHTNING WAR; MAGINOT LINE; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR.)

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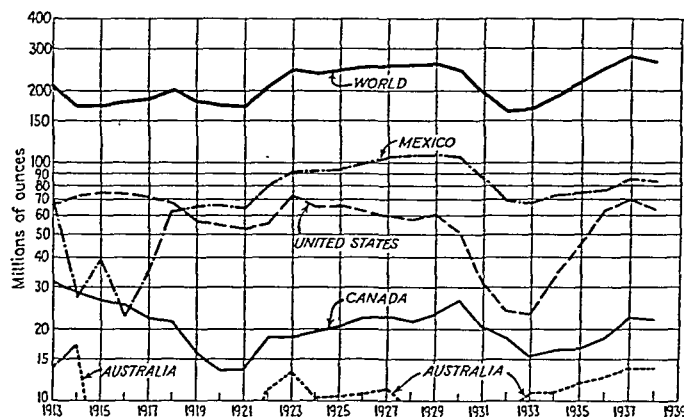
Sierra Leone: see BRITISH WEST AFRICA.

Silk and Silk Manufacture. The economic history of the silk industry for 1939 is replete with contradictory and illogical situations. In a year when new synthetic fibres designed to compete with silk were brought to more practical development, silk prices soared to levels higher than for ten years. The rising trend in consumption during the last six months of 1938 reversed itself in 1939 as a decrease of 7% in the year's consumption.

The first four months of 1939 showed an average price on the New York market of \$2.14 a pound. The 1938 yearly average was \$1.69. The rise began in May and moved rapidly upward closing in December at \$4.34 a pound. Average silk prices during 1939 were 60% above the 1938 level. The cause of the unexpected and unexplainable rise is not clearly indicated. A shortage in supply would partially account for it, but not to the extent of the 60%. The general belief was that speculation in the Japanese market got beyond control of the Government as it did about 20 years ago when the American silk market became so alarmed by severe fluctuations in the price of their raw material that special business missions went to Japan to discuss the situation with high officials. At that time, the fabric manufacturers were the sufferers, and through their trade association in the United States special statistical information was collected and disseminated as to actual stocks of silk in New York warehouses, prices quoted on the Yokohama Bourse and on the outside markets so as to dispel some of the uncertainty among American consumers as to what they might expect in price changes. For several years, prices were fairly well stabilized, and it was believed that a similar situation would not repeat itself. In 1939, it was the hosiery manufacturers in the United States who were chiefly affected. Prices in women's hosiery increased at the end of 1939 about 8% and plans were being made to utilize rayon to a greater extent than before. This did not take into consideration the plans for use of nylon, which had already appeared on sale in one American city in women's hosiery and which it was expected would be available in the late spring of 1940 for general distribution.

Silk supplies, as predicted in the 1938 report, were small at the close of 1939. Japan's internal problems of labour shortage, coal and power restrictions plus rain, frost and disease in Italy and the continued warfare in China combined to generally contract production. Japan, too, radically increased its domestic consumption of silk. At the beginning of 1940 prices were going down in New York but reports were that the silk price trend was still strong in Japan because of fears of possible shortage in New York and a belief that a further rise in world commodity prices was inevitable. At the same time, hosiery manufacturers predicted a 50% decrease in the use of silk in 1940. New fine denier, high strength rayons with nylon and vinyon would be supplemented by cotton lisle and cuprammonium rayon in toes, heels and tops of medium and lower grade stockings. This would mean a loss of possibly \$75,000,000 to Japan, a serious blow to its gold credit in the United States. The increased silk prices meant greater accentuation of the elimination of silk in fabric manufacturing. At the close of 1939, fabric mills in the U.S. were said to be consuming only 9% of the total imports. In Europe and Great Britain the consumption of silk showed slight change but, contrary to conditions in the U.S., both the United Kingdom and Switzerland showed, during the major part (first seven months) of 1939 an increased importation of 1% and 7% respectively. In France, the increase was much larger, 54%. This is principally because of the manufacture of war materials but also possibly influenced by an increased use of silk as a substitute for wool in clothing. (See also RAYON.)

(I. L. BL.)



SILVER PRODUCTION: world total and output of the major producing countries, as compiled by *The Mineral Industry*

Silver. The world's silver production is rather heavily centred in North America; this continent in 1929 furnished 75% of the total output, and 64% in 1938; Mexico is the leading producer, with 30%, followed by the United States with 23%, Canada with 8% and the remainder of the continent (including Central America, West Indies and Newfoundland) 2%. The status of the important producers is shown in the accompanying graph and table.

Figures for the first 10 months of 1939, although not quite complete, indicate a decrease in output of about 5% from the same period in 1938.

The chief decreases are in Mexico and the United States, partly offset by minor increases in other countries.

On July 1, 1939, the official U.S. Treasury price for newly mined domestic silver was raised from 64.64 cents to 71.11 cents. The London market for sterling silver opened at 21.125*d.*, and closed at 22.5*d.*, with a high of 23.5*d.* and a low of 16.0625*d.* The New York open market stood steady at 42.75 cents till late in June, but fluctuated considerably during the second half of the year, with a high of 39.75 and a low of 34.25 cents, closing at 34.75 cents.

British production of silver is comparatively small; the United Kingdom itself has only a negligible output, and Empire production centres chiefly in Canada, Australia, Burma and South Africa.

Empire production as a whole is still slightly under the 1929 level in ounces, but by less than the change in world output, so that the proportion of the world total in 1938 was 18% against 16% in 1929. (See also METALLURGY; MINERAL AND METAL PRICES AND PRODUCTION.)

World Production of Silver
(In millions of fine ounces)

	1929	1933	1936	1937	1938
Canada	23.1	15.2	18.3	23.0	22.2
United States . . .	60.3	21.0	62.8	69.3	58.7
Mexico	108.7	68.1	77.5	84.7	81.0
Other N. America .	2.8	6.0	4.8	5.1	5.4
Peru	21.5	7.3	19.9	17.2	20.5
Bolivia	6.2	5.5	10.7	9.5	6.4
Other S. America .	1.7	0.6	2.3	6.1	5.5
Germany	5.5	6.3	6.5	6.8	7.0
U.S.S.R.	0.4	1.0	5.0	5.0	6.0
Other Europe . . .	5.5	8.0	7.3	8.2	8.1
Japan	5.2	6.0	9.8	10.0	11.0
India	7.3	7.3	6.7	6.9	6.5
Other Asia	2.3	1.9	3.1	3.8	4.0
Africa	1.3	4.0	4.7	5.3	5.6
Oceania	9.9	11.6	13.2	14.8	14.9
Total	261.5	169.7	252.7	275.1	262.9

(G. A. Ro.)

Simpson, James (1874-1939), U.S. business executive, was born January 26 at Glasgow, Scotland and emigrated to the United States as a boy. He began his business career as a clerk with Marshall Field & Co., Chicago department store, in 1891, advanced to president in 1923 and was made chairman of the board in 1930. From this position he resigned in 1932. He was also chairman of the board and a director of Commonwealth Edison Co., Public Service Co. of Northern Illinois and other utilities, and was prominent in many civic enterprises. He died November 25 at Chicago.

Singapore, the capital of the Straits Settlements (*q.v.*) and main port of south-eastern Asia, is located on an island, of the same name, 27mi. long and 14 broad, area 225 sq.mi., at the tip of the Malay peninsula. It is situated at 1°20' north. The population of Singapore island (June 30, 1938) was 710,057. Singapore is the greatest British naval base in the Far East and its land and air defences have been considerably strengthened during recent years. Its garrison consists of about 7,000 men and the Royal Air Force maintains at Singapore two bomber and two reconnaissance squadrons. (W. H. CH.)

Sin Kiang (CHINESE TURKESTAN), area 705,769 sq.mi., population 4,360,020 (estimate of the Chinese Ministry of Information, 1936), is one of the largest, most remote and sparsely populated sections of China. A large part of this vast territory consists of desert, which accounts for the scanty population. The principal towns are Kashgar (80,000), Yarkand (75,000) in the south-west, and Urumtsi (50,000) in the north. The latter is the seat of the Chinese Administration. The chairman of the Provincial Government is Li Yung. Sin Kiang is not an integral part of China and is largely inhabited by peoples of Turki and Mongolian stock. Most of the province is under the control of the Chinese Administration, which is under strong Soviet influence; but some of the southern districts remain in the hands of the insurgents. (W. H. CH.)

Sino-Japanese War: see CHINESE-JAPANESE WAR; FOREIGN MISSIONS.

Skating: see ICE SKATING.

Skin Diseases: see DERMATOLOGY.

Slate. The leading slate producers, in order of importance, are the United States, United Kingdom, France and Germany; the Soviet Union, India, Belgium, Sweden, Australia and Canada account for possibly 10% of the output, and the four leaders the remainder. The United States output, which ranks first, was 492,690 short tons in 1938, a small increase over 1937, but still 37% below the pre-depression high. About 71% of the output was sold as granules and flour, 24% as roofing slate, 5% as structural and sanitary slabs, flagstones, blackboards, electrical switchboards and insulation, grave vaults, school slates and billiard table tops. The industry in the U.S. is practically self-contained, exports and imports being negligible. British and French productions have been declining since 1935, while the German output has been increasing. (G. A. Ro.)

Slawek, Walery (1879-1939), Polish statesman, was born on April 2. As a youth he became preoccupied with the misfortunes of Poland. Before the World War he was a leader of the Polish Socialist party and took part in the Pilsudski revolution of 1905. He was Pilsudski's most intimate friend and political adviser and formed the famous "Colonel's Group" which supported the marshal after his seizure of dictatorial power in 1926. Slawek entered the Polish Sejm in 1928 and

was later appointed premier. He resigned, however, to permit Pilsudski to become premier and thus strengthen the dictatorship. He became premier again in 1931 and held the post for a third time from March to Oct. 1935. He was often called the "spiritual father" of the new constitution which came into force shortly before Pilsudski's death in 1935. After assuring its operation, Slawek again retired and disbanded the bloc which had supported the dictatorship. Slawek shot himself on his 60th birthday and died at Warsaw the next day, April 3.

Sleeping Sickness: see BRITISH WEST AFRICA; HORSES; VETERINARY MEDICINE.

Slovakia. Slovakia, a republic in Central Europe, bounded on the N., W., and S. by Germany, on the E. and S. by Hungary, has an area of 14,848 sq.mi. with a population of 2,773,000, of whom the great majority are Slovaks, a Slav people closely akin to the Czechs. Their most important minorities are the Germans with about 100,000, and the Hungarians with about 70,000 people. The capital is Bratislava (Pressburg) with a population of 125,000.

Slovakia formed a part of Hungary before the World War (1914-18). In 1918 Slovakia became a part of the new republic of Czechoslovakia. Subsequent to the pact of Munich in the fall of 1938 Slovakia lost part of its territory to Hungary, but was constituted as an autonomous province within Czecho-Slovakia. Under the leadership of Mgr. Josef Tiso, Slovakia organized a semi-Fascist regime, introducing much of National Socialist legislation, pursuing a strictly anti-Semitic course, but relying on the support of the Catholic Church to which the large majority of the population belongs. The party in power was the Slovak People's Party founded by Father Andreus Hlinka. Some extremist members of the party tried to establish with the help of Germany the complete independence of Slovakia and to cut all ties with the Czechs. Leaders of this section were Dr. Bela Tuka, Sano Mach and Dr. Ferdinand Durcansky. With the support of Germany they succeeded in overcoming Czech resistance; their movement of independence gave the signal for the final dissolution of Czecho-Slovakia (*q.v.*). The Slovak diet met on March 14 and proclaimed Slovakia as an independent republic. Reverend Tiso was elected prime minister, Dr. Tuka, vice-premier and Dr. Durcansky, foreign minister. The new Government signed a treaty with Germany according to which Germany undertook to protect the political independence and territorial integrity for a period of 25 years. German armed forces received the right at all times to erect military plants in certain parts of Slovakia and to maintain there military establishments at a strength deemed necessary by Germany. The Slovak Government pledged itself to organize its own army in close co-operation with Germany and to conduct always its own policy in such a way as to correspond to the spirit of the treaty. Thus Slovakia, although nominally independent, was established as a German protectorate. A new constitution was adopted on July 21. On October 26 Reverend Tiso was elected first president of the republic. Dr. Tuka, the leader of the pro-Nazi extremists, became prime minister. The new State shows on its coat of arms three mountain peaks in light blue on red ground, the central peak crowned with the double cross of SS. Cyril and Methodius. Its flag consists of even stripes in white, light blue and red.

The war between Germany and Poland involved also Slovakia. A military agreement between Germany and Slovakia put, on August 18, the whole Slovak Army at the German disposal. The German Army made Slovakia's border with Poland one of the important starting points for the occupation of Poland. By the German victory over Poland Slovakia regained a small slice of

territory with about 9,000 inhabitants which she had ceded to Poland in the fall of 1938. The strong German influence in Slovakia aroused the opposition of some Slovak circles, among them of Dr. Karel Sidor, who was afterwards named Slovak minister to the Vatican. The economic situation of Slovakia was most difficult in the first months. Slovakia is a rather poor and backward country where the progress achieved during the last 20 years had been largely made possible by the financial strength and the progressive economic system of the western parts of Czechoslovakia. Independent Slovakia suffered from a lack of raw materials and by an unfavourable trade balance. The war which broke out in Sept. 1939 aggravated the economic situation in Slovakia as it did in all parts connected with the German economic system. (H. Ko.)

Slow-Down Strikes: see DETROIT; LABOUR UNIONS; UNITED STATES: *Strikes*.

Smigly-Rydz, Edward (1886–), Polish statesman and soldier. An orphan at the age of nine, he studied painting and philosophy in his youth at Cracow, where he first met Josef Pilsudski. During the first three years of the World War (1914–18) he fought against Russia on the eastern front as a battalion and regimental commander in Pilsudski's legions. He also served throughout the Russo-Polish war of 1919–20 and commanded the troops that captured Kiev. From 1922 to 1935, always one of Pilsudski's most intimate associates, he was inspector of the Polish army. After the death of Pilsudski in 1935 he became virtual dictator of Poland. He immediately succeeded the latter in leadership of the army (as inspector-general) and in July 1936 he was proclaimed the leading citizen of Poland after President Moscicki (*q.v.*). Just before the German invasion of Poland Marshal Smigly-Rydz was designated commander-in-chief of the army and successor to Pres. Moscicki. Less than three weeks after the war began Smigly-Rydz fled across the border to Rumania, where he was interned.

Smith College. The resignation of William Allan Neilson, who had been president of Smith college since 1917, took effect in July 1939. Mrs. Dwight M. Morrow of the college's board of trustees was appointed temporarily as acting president, and in October, Herbert John Davis, professor of English at Cornell university, was appointed fourth president of Smith, to take office in 1940–41. For the first time since its establishment in 1925, the Junior Year Abroad was cancelled because of the European war. In the autumn of 1939 a new field house was completed. Enrolment at the college for the academic year 1939–40 was 2,077 students; the faculty numbered 238, and the number of volumes in the library was increased to 266,964. The endowment in 1939 was \$6,129,902.

Smithsonian Institution, founded 1846 by bequest of James Smithson of England, "for the increase and diffusion of knowledge among men." Governing body, board of regents. Executive officer, Dr. Charles Greeley Abbot, secretary. Directs six Government bureaus; also Freer Gallery of Art and Division of Radiation and Organisms.

Activities in 1939.—*Smithsonian*: Smithsonian Gallery of Art Commission, set up by Congress, held competition for design for proposed Smithsonian Gallery of Art building, and awarded prize for best design to Eliel Saarinen; completed third year of weekly educational radio broadcasts, "The World is Yours," in co-operation with U.S. Office of Education and National Broadcasting company; established retirement system for employees paid from Smithsonian private funds; publications issued (Smithsonian

and all its branches), 99; distributed, 162,030 copies. *National Museum*: Specimens added to collection, 368,082; numerous scientific expeditions in the field; 14 special exhibitions held; visitors, 2,233,345; publications issued, 35; distributed, 69,658 copies. *National Gallery of Art*: Gallery established by joint resolution of Congress. Art works and building to contain them gift to nation by the late Andrew W. Mellon. Gallery designated as bureau of Institution, but administered by board of nine trustees; David K. E. Bruce, president; David E. Finley, director. At close of fiscal year, superstructure of building completed; expected building will be completed Sept. 1940; estimated cost, \$15,000,000; received from Samuel H. Kress and Samuel H. Kress Foundation Italian paintings and sculpture said to be one of finest private collections of Italian art in the world. *National Collection of Fine Arts*: This name designates art collections administered by Smithsonian Institution. Six special exhibitions held; 18th annual meeting of Smithsonian Art Commission (formerly National Gallery of Art Commission), held Dec. 6, 1938. *Freer Gallery of Art*: Added to collections bronze, jade, manuscript, and paintings from China, India, and Egypt. Visitors, 102,936. *Bureau of American Ethnology*: M. W. Stirling, chief, directed expedition, in co-operation with National Geographic Society, to Veracruz, Mexico, where 9 stone monuments, including one with initial-series date, were discovered. Other field work on American Indians conducted by the following members of scientific staff: Dr. J. R. Swanton, Dr. F. H. H. Roberts, Jr., Dr. J. H. Steward; linguistic studies conducted by Dr. J. P. Harrington; Henry B. Collins, Jr., and Dr. William N. Fenton added to staff; publications issued, 6; distributed, 19,527 copies. *International Exchange Service*: Official agency for United States for interchange with other countries of governmental and scientific documents; packages of such material handled during year, 714,877; weight, 719,694 pounds. *National Zoological Park*: Added to collection large number of animals, birds, reptiles, and amphibians brought back by the director from the Argentine; total number of animals in collection, 2,450; visitors, 2,201,080; \$90,000 allotted by Public Works Administration for new restaurant building. *Astrophysical Observatory*: Maintained solar observing stations at Mt. Montezuma, Chile, and Table mountain, Calif.; began observations of solar constant at station recently established on Burro mountain, Tyrone, N. Mex.; at Mt. Wilson, Calif., observatory measured distribution of energy in spectrum of brighter stars using 100-in. telescope and apparatus specially developed for this purpose; recomputed all solar-constant values since 1923. *Division of Radiation and Organisms*: Carried on investigations in the field of radiation in relation to plant growth, especially photosynthesis. factors influencing plant growth, and stimulative action of ultra-violet radiation; published 3 papers. (C. G. A.)

Smuts, Jan Christiaan (1870–), South African statesman and soldier, was born May 24 near Riebeeck West in Cape Colony. Educated at Cambridge, he was admitted to the Cape Town bar in 1895.

He fought with the Boer field forces and was commander-in-chief of the rebel forces in the Cape. After the war he became a loyal supporter of Gen. Louis Botha's policy of conciliation and co-operation with the British. For his later career as prime minister, see *Encyclopædia Britannica*, vol. 20, pp. 845–6. After 1924 Gen. Smuts was comparatively inactive in South African politics. He was Rhodes Memorial lecturer at Oxford in 1929–30 and rector of St. Andrews university from 1931 to 1934. Britain's declaration of war against Germany Sept. 3, 1939, brought him back as prime minister after Hertzog had resigned. On September 6 he formed a war cabinet, and the Union proclaimed a state of war with Germany.

Snelling, Charles Mercer (1862–1939), American educator and mathematician, was born November 3 at Richmond, Va. After graduating from the Virginia Military Institute in 1884, he taught mathematics in various southern schools and in 1888 joined the faculty of the University of Georgia, of which he was acting chancellor in 1925–26 and chancellor from 1926 to 1932. He died September 19 at Athens, Ga.

Snijders, Cornelis Jacobus (1852–1939), Dutch general and commander-in-chief of The Netherlands' armed forces during the World War, was born at Nieuwe Tonge on September 29. At the age of 20 he was appointed second lieutenant in the Dutch Army and was promoted through the ranks to general, five days after German troops crossed the Belgian frontier in 1914. Though The Netherlands maintained neutrality throughout the war, Snijders kept its army of 450,000 men completely mobilized until 1918. He was raised to commander-in-chief of the army and navy, the first time this rank had been awarded since the 18th century. After the war the Dutch Socialist party succeeded in securing his dismissal and he devoted his time thereafter to civil aviation. He was largely instrumental in the establishment of The Netherlands' direct air route to the East Indies. Gen. Snijders died at Hilversum on May 26.

Soap, Perfumery and Cosmetics. Despite the further spread of war in Europe, the two most important developments in these industries in the United States during 1939 were both of a legal or governmental nature. With barely 30 hours' grace the President signed the Lea bill, postponing the Federal Food, Drug and Cosmetics Act's effective date from June 24, 1939 to Jan. 1, 1940. The task of repackaging and relabelling so many of the products of these three large industries on short notice and at an arbitrary date line would probably have taxed the printing and container manufacturing plant of the U.S. beyond capacity, exposing producers of the industries affected to unnecessary prosecution for their inability to comply on time as well as to serious and irrelevant financial loss. Postponement was not otherwise desirable. Instead of one period—in May and early June—there were two—the second in November and December—when trade in the industries was definitely depressed by distributors' unwillingness to make commitments pending the date of the act's effectiveness. A significant point about this new law for the consumer to remember is that, presumably, it can affect only goods sold in interstate commerce. Outside those States which enact parallel laws, then, a manufacturer doing only an intrastate business may ignore the Federal act's requirements, many of which—notably those touching the certification of colouring materials, the identification of manufacturers on their labels, and the elimination of deceptively sized and designed containers—are eminently desirable both to consumers and reputable producers. Further, it is already evident that as with all such laws, enforcement will be easy with established, responsible manufacturers, difficult where irresponsibles and fly-by-nights are involved.

The second event of major importance was the amendment of the law levying excise tax on perfumery and cosmetics. It is generally accepted that, by definition, an excise tax is imposed only on the product itself. For example, the excise tax on a 50gal. drum of alcohol is on the alcohol alone; not on the drum, nor on the multitudinous additional charges that enter into the total price charged by the producer. Yet, with respect to cosmetics and perfumes the Federal Government has consistently ruled that the excise tax must be assessed on the producer's selling price. Un-

fortunately the amended law is so ineptly phrased that considerable doubt still persists as to exactly how much relief it will afford the industries concerned.

The status of these three industries in the European countries involved in war is uncertain. The use of cosmetics has been discouraged in Germany for many months. In Great Britain the consumption at least of moderately priced products had not been seriously curtailed in 1939. Inevitably in those countries where the supply of edible fats is a problem, the soap industry must be adversely affected. (H. T.)

Soccer. Soccer made considerable headway in the United States during 1939 by virtue of a visit by the Scottish All-Stars. Appearing twice at the Polo Grounds, in New York, the Scots were held to a 1–1 tie in the first game against a picked eleven representing the American Soccer League, under the auspices of the U.S. Football Association. In a return match, during an extra period, the famous tourists defeated the League team 4–2, winning the National (Open) Championship, in a match that was considered the best showing ever made by representative American soccer players against Scotch opponents.

In the National Challenge Cup competition of the Association, 64 teams played excellent ball, the winners of the national championship being the St. Mary's Celtics, of Brooklyn, vanquishing the Manhattan Beer Soccer Club, of Chicago, during a home-and-home series. St. Michael's A.C. Team of Fall River, Mass., won the national amateur championship during a contest that attracted 117 teams, defeating the Galletin S.C. in the finals. The Avella Polar Star Juniors won the national junior championship from the Apache Juniors.

In the professional circuit of the League, the Brookhattan S.C. were the American division winners, and the Scots American S.C. won in the national division. (J. B. P.)

Socialism. The year 1939 witnessed little change in Socialist alignment in the United States. The National Executive Committee of the Socialist party, in its meeting in Milwaukee on December 10 and 11, in looking forward to the 1940 campaign, recommended to the Socialist party National Convention "the nomination of a presidential ticket and an aggressive campaign in 1940 unless, as a result of inquiries initiated by the N.E.C., it develops that there is serious interest in, and support for, an independent farmer-labour campaign with which Socialists can consistently co-operate." The committee voted "full moral, financial and material support to the Finnish workers and farmers and their people's army."

In a previous session, the N.E.C. reaffirmed the party's anti-war stand and urged that the United States remain at peace. With the development of the European war crisis, the two committees appointed by the Socialist party and the Social Democratic Federation to discuss the question of unity suspended negotiations. The Social Democratic Federation N.E.C. declared in favour of the running of a third party candidate should the Democratic party fail to nominate a progressive.

In the municipal elections during the year, Jasper McLevy, Socialist Mayor of Bridgeport, Conn. (member of the S.D.F.) was re-elected. Harry W. Laidler was elected one of the two American Labor party councilmen in New York city.

In Canada, that country's Socialist party—the Co-operative Commonwealth Federation—adopted a war policy at its fall conference, which, in summary, favoured (1) adequate defence of Canada's shores (2) material aid to the Allied powers; and (3) preservation of civil liberties at home. The conference, on the other hand, opposed conscription of man power and the sending of an expeditionary force abroad.

In Europe, the Socialist movement was compelled increasingly during the year to concentrate its attention on the war crisis.

When Great Britain declared war, the National Executive committee of the British Labour party threw its support to the war, and agreed to the suspension of by-elections maintaining, at the same time, its independence from the Government and its right of criticism. The party declared that it would "use all its authority to build a peace of justice which removes the causes out of which war comes." It denounced the Government's refusal to take action on demands for the extension of self-government of the British States of India and urged a capital levy of 1% and measures to safeguard labour. The Independent Labour party opposed Britain's entrance into the war and the system of conscription, as did George Lansbury and some other members of British Labour. The New Fabian Research Bureau during the year merged with the Fabian Society.

The French Socialist party in September likewise voted its support of the war. It opposed attempts to suspend parliamentary activity and to abolish essential reforms, and urged a progressive policy in the country's North African possessions. Many members of the Workers' and Peasants' Socialist party and a number of members of the French Socialist party were arrested for their refusal to support the war.

In Belgium, Socialist Premier Paul-Henri Spaak reformed his cabinet in late January. In the general elections on April 2, 1939, 64 Belgian Labour party representatives were elected out of a total of 202, as contrasted with 70 in the 1936 elections. In the same election, the Rexist (fascist) party lost 17 of its 21 seats. The Communists elected nine deputies, the Catholics, 73. Following the elections, Premier Spaak became Minister of Foreign Affairs in the new cabinet formed by Hubert Pieriot, Catholic. Several other Socialists served in the coalition ministries formed during 1939. The Socialists urged the continuance of Belgian neutrality.

The Social Democratic Labour party of Holland during the year was admitted to the country's cabinet for the first time in its history, J. W. Albarda, president of the Labour and Socialist International, and Dr. van den Tempel, being appointed respectively to the Ministries of Waterways and of Social Affairs in the Socialist-Catholic coalition governments.

The Swiss Socialists elected 51 representatives to the National Council in the fall elections out of a total of 187, and increased their representatives in the Zurich cantonal parliament from 59 to 64. Socialists, however, were again refused a seat in the Federal Council.

In Denmark, the Social Democratic party, in the election of April 2, 1939, again emerged the leading party of the country, with a representation in the Lower House of 64 out of 149. The party, however, in this election, lost four representatives and failed, for the first time since 1920, to increase its votes. It failed to secure the abolition of the Upper House, or Landsting. It sought throughout the year to preserve Danish neutrality.

In Sweden, the Social Democratic Government in December reformed its cabinet, substituted Christian de Guenther for Richard J. Sandler as foreign minister, and added several non-Socialists to the ministry, with a view of preserving its neutrality and of uniting all parts of the country back of the Government in case of hostilities.

In Finland, the general elections of July resulted in the elections of 85 Social Democrats out of a total of 200, an increase of two over the elections of 1936. The Agrarians and Progressives, received 56 and 6 seats respectively. The so-called Patriotic National Movement, the fascistic party of the country, decreased its parliamentary representation from 14 to 8.

Following the war, the Socialists joined with the trade union

movement in proclaiming the solidarity of the Finnish working class in opposition to the Russian invasion. In the reorganized cabinet, Väinö Tanner, Socialist leader, minister of finance in the old cabinet, became minister of foreign affairs.

In Australasia, Socialists and Labourites in New Zealand and Australia gave their support to the British Government, though in each country a minority of the party members opposed sending their manpower to Europe. (See also COMMUNISM; SPAIN.)

(H. W. L.)

Socialist Party. At the beginning of 1939 it appeared that the year would see the considerable achievement of a reunion of Socialist forces, but negotiations between the Socialist Party and the Social Democratic Federation were suspended because of uncompromisable differences on the war issue. The leaders of the S.D.F. before the outbreak of war in Europe took a strong collective security stand, and after the continuance were in the vanguard of those demanding help for the Allies even under certain possible contingencies to the extent of participation in war. The Socialist Party with equal firmness worked to keep America out of war and of steps leading to war, not because it condoned Hitler's and Stalin's aggressions, but because it held that America's best service to herself and mankind would be to make democracy work, mediate for peace, bind up the wounds of war's victims and afford her citizens a chance to aid those underground movements in Europe which are the best ultimate hope of lasting peace in that continent. This opinion was general among Reading, Pa., Socialists and there Socialist unity was achieved. The Socialist administration in that city lost its campaign for re-election by a very narrow margin. In Bridgeport, Conn., Jasper McLevy and his administration were easily re-elected. His Socialist party in that State has no affiliation with any national Socialist group.

In New York State Socialists generally, with the approval of the Socialist Party, joined the American Labor Party as individuals. This was in accordance with the standing decision of the Socialist Party to act electorally with and through any genuine independent labour party. Dr. Harry W. Laidler, long a Socialist leader, was elected under proportional representation to the New York city council as an American Labor Party candidate.

During 1939 Roy Burt, after two-and-a-half years of devoted service, resigned as secretary of the party, and was succeeded by Travers Clement of California.

(N. T.)

Socialist Soviet Republics: see UNION OF SOVIET SOCIALIST REPUBLICS.

Socialized Medicine. The National Health program, which was prepared for the Interdepartmental Committee to Co-ordinate Health and Welfare Activities by its technical committee, was transmitted to President Roosevelt by Miss Josephine Roche, chairman, on Jan. 12, 1939. The President, in his message of Jan. 23, 1939, transmitted the report and recommendations on national health to the Congress of the U.S. with a recommendation "for careful study by the Congress."

On Feb. 28, 1939, Hon. Robert F. Wagner, United States Senator from New York, introduced in the Senate of the United States "A bill to provide for the general welfare by enabling the several States to make more adequate provision for public health, prevention and control of disease, maternal and child health services, construction and maintenance of needed hospitals and health centres; care of the sick, disability insurance and training of personnel; to amend the Social Security Act; and for other purposes." The Wagner health bill obviously offered a legislative means to implement the Federal portion of the National Health program.

This bill, if enacted into law, would provide appropriations to be used largely for matching State funds under the provisions of five main titles of the bill. These titles were proposed amendments or additions to the Social Security Act. Appropriations were proposed as grants to States for maternal and child welfare; medical services for children and services for crippled and other physically handicapped children; public health work and investigations; grants to States for hospitals and health centres; grants to States for medical care; grants to States for temporary disability compensation.

The terms under which these proposed grants would become available for matching State funds were to be contained in rules and regulations required to be promulgated by the chief of the Children's Bureau, with the approval of the secretary of Labor; the Surgeon General of the Public Health Service, with the approval of the secretary of the Treasury; the Social Security Board, and the Federal Emergency Administrator of Public Works. These rules and regulations would constitute the measures by which State plans contemplated under this bill would be approved or rejected.

Criticism against the Wagner health bill was voiced strongly by the professions and the hospital associations. The American Medical Association pointed out that the Wagner health bill does not safeguard in any way the continued existence of the private practitioners; does not provide for the use of the thousands of vacant beds now available in hundreds of church and community general hospitals; makes Federal aid for medical care the rule rather than the exception; does not recognize the need for suitable food, sanitary housing and the improvement of other environmental conditions necessary to the continuous prevention of disease; insidiously promotes the development of a complete system of tax supported governmental medical care; provides compensation for loss of wages during illness, but also proposes to provide complete medical service in addition to such compensation; provides for supreme Federal control since Federal agents are given authority to disapprove plans proposed by the individual States; prescribes no method for determining the nature and extent of the needs for preventive and other medical services for which it proposes allotments of funds; is inconsistent with the fundamental principles of medical care established by scientific medical experience and is therefore contrary to the best interests of the American people. The House of Delegates instead would urge the development of a mechanism for meeting the needs for expansion of preventive medical services, extension of medical care for the indigent and the medically indigent, with local determination of needs and local control of administration, within the philosophy of the American form of government and without damage to the quality of medical service. It says that any State in actual need for the prevention of disease, the promotion of health and the care of the sick should be able to obtain such aid in a medical emergency without stimulating every other State to seek and to accept similar aid, and thus to have imposed on it the burden of Federal control. The mechanism by which this end is to be accomplished, whether through a Federal agency to which any State in need of Federal financial assistance can apply, or through a new agency created for this purpose or through responsible officers of existing Federal agencies, must be developed by the Executive and the Congress, who are charged with these duties.

In submitting its preliminary report (Senate Report No. 1139, 76th Congress, 1st Session) the subcommittee of the Committee on Education and Labor points out that it is in agreement with the general purpose and objectives of the Wagner bill, S-1620, establishing a National Health program. It is expected that some proposal to implement the National Health program will be presented to Congress in 1940.

Proposals for legislation in the field of socialized medicine were

not confined to activities in the Congress of the United States. Although compulsory sickness insurance proposals were defeated in Massachusetts, New York and Rhode Island in 1938, laws pertaining to socialized medicine were enacted in 1939 in Connecticut, Michigan, New York, Pennsylvania and Vermont.

During 1939 the State medical societies of California, Michigan, Pennsylvania and the Medical Society of the District of Columbia adopted State-wide plans for the distribution of medical services to low income groups of the population within their jurisdictions. The Medical Society of New Jersey prepared a tentative State-wide proposal for the care of the indigent. Scores of county medical societies also continued to operate medical service plans for the benefit of indigent or low income people. (R. G. L.)

Social Security. The outstanding social security event of nearly 200 amendments to the Social Security Act, which completely changed the basic principles and direction of the national old age insurance program. Whereas the 1935 Act limited its monthly annuities to the covered workers themselves, the 1939 Old Age and Survivors Insurance plan extended the benefits to the aged wives and aged widows of the insured, to their dependent minor children, to younger widows with minor children to support, and, when there are no other survivors, to aged parents wholly dependent upon the deceased insured persons.

Because the new law recognizes the social necessity of providing the greatest protection to the oldest and lowest-paid workers, the new benefits are much more liberal than formerly. Annuities to retired workers at 65, called the "primary" benefits, are computed at 40% of the first \$50 of the average wage earned since entering the system, plus 10% of the balance up to \$250 monthly. One per cent of the total is added for each year since 1937 in which at least \$200 was earned. Thus, a worker attaining age 65 who averaged \$100 monthly in the preceding three years was entitled upon retirement in Jan. 1940, to 40%, or \$20, on the first \$50 of his average earnings and to 10%, or \$5, on the balance, making a total of \$25 monthly. By adding 1% for each of the three years of coverage, or 75¢, the monthly annuity became \$25.75, which will be paid to him each month for the rest of his life.

Benefits for Wives and Children.—The wife of an insured worker, upon reaching age 65, is allowed 50% of her husband's primary benefit, or in the example cited above, a total of \$38.63 monthly for the couple. She may receive a larger primary benefit if entitled to one in her own right. Each unmarried dependent child of a retired worker may receive 50% of the wage-earner's primary benefits until he reaches the age of 16, or 18 if regularly attending school.

Benefits for Widows and Orphans.—The new program also provides monthly benefits for survivors of insured workers who die after Dec. 31, 1939. Instead of the meaningless single lump-sum payments provided by the 1935 Act, a widow aged 65 or over is now entitled to three-fourths of her husband's primary benefits for the rest of her life unless she remarries. In the example used above this would amount to \$19.31 monthly. For every child under 16 or 18 she is entitled to 50% additional benefits. Widows of any age with dependent minor children are entitled to three-fourths of the primary annuity for themselves and 50% of the primary benefit for each minor dependent child.

Benefits for Dependent Parents.—If a worker leaves no other survivors, his dependent parents 65 years of age and over wholly dependent upon his support are each entitled to benefits of 50% of the primary benefits. A lump-sum payment not exceeding six times the primary annuity is paid in case no dependent survivor is eligible for any benefits. Maximum benefits permissible under

the Act are either double the primary insurance benefits, 80% of average wages, or \$85, whichever is the least, while the minimum is \$10 monthly. Earnings of \$15 or more per month automatically stop the benefits. All the above benefits are paid to or on behalf of insured workers who earned at least \$50 in one-half of the calendar quarters elapsing between the end of 1936 and the time of death or retirement, or at least in six such quarters. Orphans and widows are entitled to benefits if the worker had earned \$50 in six of the 12 quarters immediately preceding his death. The system was widened in 1939 to include workers in banks, savings and loan associations and other institutions not fully owned by the Government, certain maritime workers and persons employed beyond the age of 65. On the other hand, some small classes of workers have been excluded by the new law.

The 1939 changes halted the scheduled increase in the taxes for the three years 1940-42, keeping them at 1% each for employers and workers for this period. With the increased and extended benefits, the advance in the monthly benefit payments from 1942 to 1940, and the reduction in contributions, the menace of the huge reserves originally contemplated was eliminated. By Sept. 1939, 408,362 lump-sum payments amounting to \$22,505,990 had been certified under the 1935 provisions. In August, the average lump-sum benefit certified amounted to \$87.04, while the average of all such payments since April 1937 was \$55.11. The total assets of the old age insurance fund reached \$1,727,591,400 by Sept. 1939.

Public Assistance.—The most important amendment in the old age assistance program in 1939 increased the State grant for which the Federal Government will allow its 50% share from \$30 to \$40 monthly. The new law also emphasized the "needs" test for all Federal-State grants and required that personnel be chosen on a merit basis. The Federal subsidy for aid to dependent children was raised from one-third to one-half of the grants up to definite maxima, as in the case of the aged and the blind, and allowances are permitted for children up to 18 when attending school. During Aug. 1939, old age assistance grants amounting to \$36,415,257 were paid to 1,874,651 persons, or an average of \$19.43. In the same month 721,232 dependent children received Federal-State assistance costing \$9,337,801, the payments averaging \$31.20 per family, while 45,214 blind persons received \$1,040,180, an average of \$23.01 per person. Utopian old age pension schemes were overwhelmingly defeated by the voters of California and Ohio during the November elections.

Unemployment Insurance.—Of the 1939 changes in the unemployment insurance phase of the Social Security Act, the most significant provided that only the first \$3,000 of yearly wages should be taxed and that the State personnel be selected on a merit basis. Practically the same inclusions and exclusions as were written into the Old Age and Survivors Insurance system were made in the unemployment insurance program. A total of \$369,774,000 was paid to unemployed workers from Jan. to Nov. 1939, in the 48 States, Hawaii, Alaska, and the District of Columbia. The monthly peak of \$44,491,421 (in 4,170,406 checks) reached in August, dropped to \$26,700,000 by October. In 1938, an average of \$83.89 each was received by 2,157,522 workers under 17 of the unemployment insurance systems. At the end of Aug. 1939, the State reserves held by the Federal Government amounted to \$1,410,448,000.

Health Insurance.—Intensification of the health insurance campaign was recorded during 1939. U.S. Senator Robert F. Wagner of New York introduced a Federal-State health measure early in 1939. (See also CHILD WELFARE; LAW [CASE]: *Social Security*; LEGISLATION, FEDERAL; *SOCIALIZED MEDICINE*. (A. EP.)

Great Britain.—In the field of health insurance, apart from an Act providing for the continuance of the insurance of insured

persons engaged in war occupations at home or abroad and for certain adjustments necessitated by war conditions, there was no new legislation in Great Britain during 1939; but an important legal decision, clarifying the law as it stood, was made. In February the Court of Appeal decided that an employee who receives sickness benefit under the scheme is entitled also to be paid wages under his contract of service, and as a consequence a municipal corporation ruled that any employee falling sick should be given a week's notice and at the same time told that he would be reinstated on recovery. Under a Whitley Council ruling it was later decided that dismissal of work people in these circumstances was unnecessary and inadvisable and that existing contracts should be confirmed, any employer not intending to pay wages during sickness making this clear to the employee in writing. There are some 20,000,000 contributors to the health scheme, one-third of whom are women; contributions amount to about £31,000,000 annually, benefits to £36,000,000, administration to £6,000,000 and total accumulated funds to £140,000,000. Renewed efforts to increase the amount of and lighten the conditions attaching to old-age pensions were unavailing, as also were strongly supported campaigns to reduce the pensionable age of spinsters from 65 to 55 and to admit dependents of insured persons to health insurance benefits. The prime minister in July, sanctioning an inquiry into the old-age pensions position, made it clear that no increase that would impose an undue burden on the exchequer was possible. The inquiry then undertaken was suspended on the outbreak of war, but in November Sir John Simon promised its immediate resumption, and a report was scheduled for early 1940. There are some 3,900,000 persons drawing pensions (including 650,000 widows and 275,000 dependent children), of whom 550,000 are non-contributory. Of the £100,000,000 paid annually under the contributory, non-contributory and voluntary schemes, £14,500,000 is paid by the State for non-contributory pensions, leaving a contributory pension figure of £85,000,000 of which the exchequer provides £55,000,000, representing an income-tax of about 12s.3d. in the £.

Unemployment Insurance.—The annual census in July revealed the highest number in employment in the general scheme yet recorded—12,912,000 (656,000 more than the previous year), and the lowest unemployment figure since 1929, viz., 1,282,000; this total further decreased before the start of the war, but in December it stood at 1,361,500 (after having been higher), a number less by nearly 500,000 than that for Dec. 1938. The latest statistics show that in 1938 income on the general account was £65,895,000, about £927,750 more than in 1937, the increase derived from the classes of workers first made insurable in 1938 being offset by the decrease of employment. Expenditure totalled £62,320,000 (up £19,755,000 in 1937), and a special debt repayment of £20,000,000 was made. The income on the agricultural account rose by £64,900 to £1,942,000, and the expenditure from £700,000 to £993,650. In view of this satisfactory state of affairs benefits were increased (from March 30) and contributions reduced (July 2), these changes to remain in force till July 1942. In 1939 a short amending Act was passed providing for payment of contributions in respect of holiday periods, extending the provision of payment of dependent's benefit, and providing training courses for unemployed young persons; and after the outbreak of war the Unemployment Assistance Board was empowered to give assistance, at similar rates as those to be insured, to the uninsured who were in need through having been evacuated or through other circumstances arising out of the war. (L. H. D.)

Social Service. The outstanding events of the year 1939 in the field of social service in the United States were concerned again, as in the year 1938, with further

progress towards the adoption of new measures of public welfare, public assistance, or social security, and the development of the rapidly growing public social services in the various States. The continuation of the depression meant that very large numbers of people continued to be in need of relief in many parts of the country, and the continued lack of employment for men and women, able and willing to work, has created a grave situation, particularly in the urban industrial centres. The assistance extended to the unemployed and the so-called "unemployables" on relief has been very inadequate in every year since 1935, when the FERA came to an end. Federal aid for relief continued to be provided through the WPA, now called the Works Projects Administration instead of the Works Progress Administration.

Reports in Oct. 1939 showed that in nine out of 43 States reporting, there were very low relief averages, ranging from \$3.96 to \$9.85 per family per month. Destitute people, especially employable people, have sometimes been left to subsist on the food supplies distributed as "Federal Surplus Commodities." This long-continued inadequacy of relief, particularly inadequate food, has threatened the health of the people in some areas. A new experiment in the distribution of "surplus commodities" by means of stamps redeemable at local groceries was satisfactorily carried out in a few communities, and this experiment is to be continued in 1940 on a large scale. Direct relief was granted to a considerable number of farm families under the Farm Security Administration. Some improvement in the relief situation, however, has resulted from the removal of large numbers of families and individuals from the general relief rolls to the three important public assistance services under the Social Security Act.

During 1939 large expenditures of more than \$8,000,000 for social welfare purposes were made through Federal grants to the States for three other important services provided under the Social Security Act, but administered by the U.S. Children's Bureau, for setting up proper child welfare services; to assist the States with grants for the care of crippled children, and for maternal and child welfare. In 1939 there were 44 States with regular legislative sessions and a large grist of new legislation. Many of these new acts of the State legislatures dealt with the reorganization of the State welfare services in order to make proper administrative provision for the new and developing services; and there have also been changes in the State welfare authority to provide for greater efficiency in three forms of public assistance—child welfare, care of crippled children, maternal and child welfare, along with the special services provided by the great public benevolent institutions. An improvement in the social services through new State merit systems has been an important development. The rate of progress in the adoption of State civil service laws has been greatly accelerated. Recommendations of the President's Interdepartmental Committee on Health Services were incorporated in the bill introduced by Senator Wagner of New York but not reported back from the Senate committee until too late for action during the regular session.

Federal reorganization, delayed in 1938, made some progress in the creation of the Federal Security Agency and the Federal Works Agency. (See also CHILD WELFARE; PUBLIC HEALTH SERVICES; RELIEF; SOCIAL SECURITY; WORKS PROGRESS ADMINISTRATION.) (E. AB.)

Societies and Associations: see under specific name.

Sodium Carbonate.

Originally produced by chemical processes from salt, increasing amounts of sodium carbonate are being recovered from natural brines accumulated in salt lakes in arid regions. The United States output, now exceeding 100,000 short tons annually, comes mainly as a by-

product in the recovery of borax from brine lakes in California. Kenya exports about 40,000 tons, and small amounts are recovered in Canada and South Africa. (G. A. Ro.)

Softball. Softball boasts an estimated 1,000,000 players and 105,000 teams playing the game. Played under the supervision of the Amateur Softball Association of America, the game is making remarkable progress.

The national championship men's team of the association turned up in the Covington (Ky.) Boosters after conquering the Columbus (Ohio) team in the finals. The Alameda (Cal.) Girls, who in 1938 won the women's national championship under the name of the J. J. Kriegs, retained their laurels in 1939, defeating the Louisville (Ky.) team in the finals, in one of the most thrilling games on record. The Metropolitan League title, for which six squads competed, was won by the Newark-Linder team of girls. The Roverettes and the Americanettes representing New York in the women's contests played their games in Madison Square Garden. The former won 25 and lost 13, and the latter captured 20 and dropped 15. In eight games between the two teams, the Americanettes prevailed, 5-3. The girls' games brought new thrills indoors. (J. B. P.)

Soil Erosion and Soil Conservation.

Man-induced erosion continues to be a major problem in every agricultural region in the world, except in north-western Europe.

In North America erosion by wind and water has reached immense proportions. In the Great Plains region of the United States, wind erosion, caused largely by the destruction of vegetation through overgrazing, cropping and continued drought, has damaged millions of acres of land, much of it beyond immediate reclamation. In the high-rainfall region of the eastern seaboard, especially in the Piedmont region of the South, sheet and gully erosion have robbed the land of most of its topsoil. In the United States the erosion problem is being attacked on many sides. The Agricultural Adjustment Administration pays subsidies to farmers co-operating in the crop adjustment program, which emphasizes the substitution of soil-saving for soil-depleting crops. The Soil Conservation Service is working in some 500 selected areas throughout the country demonstrating effective erosion-control practices. Thirty-six States have enacted laws enabling farmers to establish by popular election distinct units of local Government with authority to conduct conservation operations. Farmers work co-operatively through district officials in setting up erosion control measures. The district receives assistance, such as technical personnel, materials, equipment and in some cases labour for installing control devices, from Federal and State agencies.

The Canadian erosion problem is a continuation northwards of conditions prevailing in the Prairie and Great Plains States of the United States. Official action favouring conservation first came with passage of the Prairie Farm Rehabilitation Act of 1935 which encourages recipients of drought assistance to adopt approved cropping and cultural methods.

Strip cropping, cover cropping and fallowing are promoted to check soil blowing.

The almost total absence of forests and the primitive methods of farming in some parts of the region explain the tremendous amount of erosion damage in the Mediterranean basin. Outside of Italy and the Italian and French mandates in northern Africa, very little effort at erosion control is being made. In Italy a stupendous task of land reclamation and soil conservation has been going on since 1930. It is estimated that one-third of the country will be improved under the Bonifica Integrale during the 14-year period ending in 1944.

Rapid deforestation of the Transylvanian Alps since the World War has contributed to the frequent flooding of the River Tisza and its tributaries running through the Plain of Hungary, where there is also a serious wind erosion problem. Equally serious erosion is progressing in the Rakovnik area of Bohemia and in the basin of the Borsary river in the Carpathian mountains.

In East Prussia and Poland the shifting of sand dunes is a major problem. In eastern Poland and in central Russia and the Ukraine sheet and gully erosions are quite severe, while wind erosion on the steppes and the expanding area of drifting sand in south-central Asia add to the erosion problems of the Union of Soviet Socialist Republics. With extension of mechanized co-operative farms into semi-arid sections the problem of wind erosion has greatly increased. Chief erosion-control measure thus far adopted by the Soviets is the planting of shelter-belts.

The Orient presents some of the most tragic results of erosion, and some of the best examples of soil conservation. The land around the headwaters of the Yellow river in China is the most severely eroded region in the world, while the terraced hillsides of Japan illustrate conservation at its best.

Continuous overgrazing has been largely responsible for much of the catastrophic erosion that scars the foothills of the Himalayas. Erosion does not occur to any great extent in Japan or on the European estates in Java. Large-scale sugar cane agriculture and increasing pressure of population have made erosion a serious problem in the Philippine islands. In Ceylon, where erosion on the rubber and tea plantations has become very serious, control measures are now progressing rapidly. The Ordinance of 1935 provides for treatment of badly-eroded lands; no crown lands above 5,000ft. can be alienated except by special governmental approval. All new landowners are required to install and maintain recommended erosion control measures, at their own expense.

The loss of soil by erosion is nowhere more rapid than in Africa. Veld burning and kraaling, generally employed throughout the Union of South Africa, are direct causes of accelerated erosion and have prevented natural recovery of pasture vegetation after droughts. To encourage the installation of erosion control measures, South Africa has adopted a program of Government subsidy for farmers. Since 1935 five Government schemes have operated.

In Uganda, where cotton for export is grown on large communal fields year after year, gullies two or three feet deep may occur during single rains. In Kenya a Soil Conservation Service provides special erosion control services to the farmers.

The natives of central and northern Nigeria have evolved a system of ridge and basin cultivation that effectively checks erosion. The governments of the Gold Coast and French West Africa are protecting existing trees and planting shelter-belts to prevent further extension of mobile sand areas.

In Australia erosion by both water and wind has caused tremendous damage. No unified national plan of action against erosion has yet been taken. However, the South Australian Government introduced a scheme for reducing pastoral rents with special consideration for lessees who agree to reduce their stock, fence off affected areas and set aside permanent reserves for seeding native plants and trees. In New South Wales a Soil Conservation Service has been created to co-operate with land owners in establishing anti-erosion measures.

In South America erosion has not reached serious proportions, though deforestation in many regions, overgrazing of plains and failure to use manures and fertilizers make some of the countries vulnerable to this danger. (See also DROUGHT; DUST STORMS.)

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Soldiers' Bonus: see ADJUSTED COMPENSATION.

Solomon Islands: see PACIFIC ISLANDS, BRITISH; PACIFIC ISLANDS, MANDATED.

Somaliland, British: see BRITISH EAST AFRICA.

Somaliland, French: see FRENCH COLONIAL EMPIRE.

Somaliland, Italian: see ITALIAN COLONIAL EMPIRE.

South Africa, British: see BRITISH SOUTH AFRICA.

South Africa, The Union of. Area 472,550 sq.mi. (including Walvis Bay 430 sq.mi.); pop. (est. June 30, 1939) 10,160,000 (Europeans 2,116,500; native 6,997,500; coloured 814,800; Asiatic 231,200). Chief towns (pop. census 1936): Cape Town (legislative capital) (344,223); Johannesburg (519,384); Durban (259,606); Pretoria (128,621); Port Elizabeth (109,841). Governor-general: Rt. Hon. Sir Patrick Duncan; languages: English 39%; Afrikaans 56%; religion: European population: Christian (Dutch Reformed Churches 55%; Anglican 19%; Methodists 6%; Presbyterians 5%).

History.—The Union is a self-governing Dominion of the British Commonwealth of Nations. The four provinces of which it consists, the Cape of Good Hope, Natal, the Transvaal and the Orange Free State, extend from the southernmost point of the African continent to the Limpopo in the north. The former German colony of South West Africa is administered under mandate as an integral part of the Union, but this territory has not been incorporated as a Province. There are in effect two capitals: the seat of the Government is at Pretoria; the seat of the legislature is at Cape Town.

General Hertzog led the United Party as prime minister, until the outbreak of war in 1939. The period was one of considerable uncertainty owing to doubt as to the position of the Union should hostilities break out. The Government adhered to the declaration by General Herzog after the crisis of 1938 that, in the event of the United Kingdom being involved in war, the attitude of the Union would be decided by the South African parliament. In September General Hertzog's proposal for a modified neutrality was defeated in parliament by 80 votes to 67. General Smuts assumed the premiership and South Africa declared war on Germany. General Smuts's cabinet contained J. Hofmeyr, minister of finance, and Colonel Reitz, minister of native affairs. Colonel Stallard, the leader of the Dominion Party, became minister for mines, and Mr. Madeley, the leader of the Labour Party, minister for labour and social welfare. General Smuts took an early opportunity of defining the nature of the Union's participation in the war: it was, he said, to be conditioned by considerations of geography and the special conditions attaching to South Africa. Military preparations are to be confined to placing home defence in a high state of efficiency, therefore no encouragement is to be given to citizens of the Union to serve abroad. At the same time the Government promised to give physical support to the Allies in the matter of trade, shipping and finance, also to maintain the defences of Simonstown and to allow the free usage of that naval base by British warships. Only by pursuing such a policy, General Smuts declared, could the Union secure protection for the conveyance of her overseas trade. The Government's policy found a wide measure of support throughout the country. Colonel Reitz was sent to the United Kingdom to join the ministers from other

Dominions in their consultations with the Imperial Government on questions of defence. General Smuts had a majority of 17 at the end of the year and appeared to be in little danger of losing the leadership in parliament. General Hertzog's party held 38 seats and Dr. Malan's held 29. Negotiations between the two opposition leaders for a fusion of their parties are still proceeding; agreement appears likely to be based more on opposition to General Smuts's policy than on the republicanism which is the avowed objective of the Malanites. In Jan. 1940 it was announced that General Hertzog would be regarded as official leader of the opposition and would introduce a motion of no confidence in the Government at an early opportunity. Elections to the Senate took place in November and resulted in a Government majority.

The Union continues to enjoy an exceptionally sound financial position; in spite of larger expenditure on defence her citizens face 1940 without fears of heavy increases in direct taxation. It is estimated that gold production in 1939 will establish a record; the total for 11 months of the year was over 11,000,000 ounces. The Government decided to appropriate all proceeds from the sale of gold in excess of 150 shillings an ounce and some £4,000,000 additional revenue will be secured from this tax. The revenues of both the Government and the State railways are favourable. A program of public works involving the expenditure of some £6,000,000, also expenditure of some £4,000,000 by the National Road Board, are being carried through in spite of the war. The natural and industrial resources are under investigation by a committee of experts. Increased exports of wool and other produce add to the prosperity of the Union and provide essential supplies for Great Britain in her war effort. During 1939 the Union was visited by the president of Portugal and the Government has appointed a minister to represent her at Lisbon. Increasing attention is being paid to the welfare of the native population. (J. L. K.)

Education, 1937.—State and State-aided: European schools 4,471; scholars 381,550; native schools 4,850; scholars 546,225; higher, average number of students 8,707.

Banking and Finance.—Revenue, ordinary (est. 1939-40) £44,110,000; expenditure, ordinary (est. 1939-40) £44,442,014; public debt (Mar. 31, 1939) £278,876,360; notes in circulation (Aug. 25, 1939) £16,712,000; gold reserve (Aug. 25, 1939) £26,910,000; exchange rate (1938) £100.5 S.A.=£100 sterling.

Trade and Communication.—External trade: imports, total 1938 £95,886,917; (Jan.-June 1939) £48,413,783; exports, domestic (including gold ear marked) 1938 £102,906,492; (Jan.-June 1939) £68,300,483; re-exports 1938 £2,992,613. Communications and transport: roads, fit for motor traffic (1937-38) 85,428 mi.; railways, including S.W.Africa (Mar. 31, 1938) 13,620 mi.; airways, including S.W.Africa (1938): passengers carried 34,162; freight and mails carried 3,005,639 lb.; mileage flown 1,862,195; shipping (1938) entered 6,182; net tonnage 24,869,085; cleared 6,190; net tonnage 24,908,024. (Dec. 31, 1938): Motor vehicles licensed: cars and taxis 302,069; buses, vans and trucks 48,212; cycles 25,314; wireless receiving set licences 189,321; telephones, instruments in use 175,711.

Agriculture, Manufactures, Mineral Production.—Production (in metric tons): gold (1938) 12,161,392 fine oz.; diamonds (1938) 1,238,608 metric carats; maize (1938-39) total 2,535,000; coal (1938) 16,284,000; sheep, number (Aug. 31, 1938) 39,001,481; cattle, number (Aug. 31, 1938) 11,371,733; wool (1938) 94,303; wheat (1938-39) European cultivation 465,200; cane sugar (1938-39) refined 472,600; iron ore (metal content) (1938) 320,000; pig iron and ferro-alloys (1938) 294,400; steel (1937) 284,000; silver (1938) 1,135,374 fine oz.; manganese ore (metal content) (1938) 238,600; chrome ore (chromic oxide content) (1938) 79,400; asbestos (1938) 21,900; wine (1937-38) European cultivation 347,091 hectolitres; tobacco (1937-38) European

cultivation 9,236; potatoes (1937-38) European cultivation 173,695; oats (1937-38) European cultivation 86,158; barley (1937-38) European cultivation 25,809; mohair (1938) export 1,900; copper (smelter production) (1938) 11,100; ground-nuts (1937-38) European cultivation 8,700; benzol (1938) 1,900; superphosphates of lime (1937) 164,000. Industry and labour (Census 1936-37): establishments 9,987; employees, European 140,203; others 192,565; value of gross output £172,863,087; value of net output £79,931,813. Employment index, European (average 1925=100) average 1938 174.9; June 30, 1939, 177.0.

(W. H. WN.)

South America: see ARGENTINA; BOLIVIA; PERU; ETC.

South Australia. Area 380,070 sq.mi.; pop. (est. Dec. 31, 1938) 595,109. Chief town (pop. Dec. 31, 1938), Adelaide (321,412). Governor, Sir Charles Malcolm Barclay-Harvey, K.C.M.G.

History.—Sir Winston Dugan was succeeded as governor of the State by Sir Malcolm Barclay-Harvey, who arrived in Adelaide on August 12. Extensions to Parliament House costing £250,000 were completed in June and were opened by the governor-general, Lord Gowrie.

Pastoral and agricultural conditions were affected to some extent by scarcity of rainfall early in 1939 and by falling prices. The Government's active policy in combatting soil erosion was reflected in the introduction of a measure to vary the terms of pastoral leases so that lessees should be compelled to preserve a proportion of natural timber on their land. Experiments made with a Russian grass imported from the United States of America yielded good results in arresting sand drift. The year was one of great progress in manufacturing industries. Existing factories were extended, and companies were formed for the manufacture of motor cars, cellulose and sulphuric acid. In estimating a budget deficit of £570,000 for the financial year 1939-40 the Treasurer announced an increase of 4d. in the £ on income tax.

Early in the year it was reported in Adelaide that remains suspected to belong to the ill-fated Leichhardt expedition of 1848 had been discovered in the Simpson desert. An expedition led by Dr. C. T. Madigan crossed the Simpson desert and returned to Adelaide in August with valuable scientific material, but without having found any trace of Leichhardt. (L. R. Mc.)

Finance.—In 1938-39: revenue, £12,303,598; expenditure, £12,700,921; debt outstanding (June 30, 1939) £110,307,250.

Communications.—Roads (March 30, 1939) 22,412 mi. fit for motor traffic; railways (1938), Government 2,557 mi.; motor vehicles licensed (Dec. 31, 1938): cars 60,537; trucks 24,985; cycles 10,213. Wireless receiving set licences (Dec. 31, 1938) 111,850.

Agriculture and Manufactures.—Wheat 43,428,423 bu.; barley 8,647,043 bu.; grapes 189,614 tons; currants 187,332 cwt.; wool 86,606,388 lb.; butter 22,428,298 pounds. Industry and labour, 1938: factories 1,980, employees 44,084; gross value of output £36,239,937; unemployment (Trade Union returns) average (1937-38) 7.3%.

South Carolina has an area of 30,989 sq.mi., including almost 500 sq.mi. of coastal waters. Pop.: 1930, 1,738,765; estimated July 1, 1938, 1,875,000. Columbia, the capital, had 51,581 in 1930, and Charleston, 62,265.

History.—Gov. Burnet R. Maybank has been sparing of pardons and has actively though unsuccessfully striven for a State police system. His recommendation to restrict the governor's pardoning power brought no response. Late in the year 1939 bands labelled K.K.K. in several up-country counties occasionally committed violence against racial or political opponents or supposedly immoral persons, which brought vigorous investigation and early

arrests. The 1939 legislative session (January 9 to July 1 with week-end intermissions) was the longest on record for the State, on account of squabbles over revenue measures, and the continued growth of local legislation of no more general concern than a town ordinance. The growing need for county legislative bodies is little realized.

Education.—Whites in public schools 1938-39, 266,882; Negroes, 220,728; expenditures respectively, \$15,952,094 and \$2,502,437. The text-book rental system was superseded in a few places by free text-books (long used in some cities). College students were allotted \$157,380 for labour or services in their institutions by the National Youth Administration 1938-39.

Charities, Correction and Social Legislation.—Inmates of the State hospital (for mentally diseased) numbered 4,372, June 30, 1938, besides 765 on parole. The State penitentiary contained, June 30, 1939, 1,258. Many prisoners of all grades are on county chain gangs. Executions, year ending June 30, 1939, ten. The Department of Public Welfare, created May 13, 1937, has distributed since then to the aged, the blind, children, etc., \$6,456,740, 45% of which was Federal funds, and also goods supplied by the Federal Surplus Commodities Corporation valued at \$3,227,307. The South Carolina Unemployment Compensation Commission (established 1936) paid to unemployed workers, year ending June 30, 1939, \$1,782,942.

Finance.—State Government's receipts for the year ending June 30, 1939, were \$53,838,838, \$6,450,082 being Federal aid. The surplus maintained for several years disappeared under the burden of social security. Total State debt June 30, 1939, \$47,313,187, mainly for highways; in addition about \$17,000,000 contingent liabilities on guarantee of county highway bonds. Federal internal revenues collected in South Carolina 1938-39 totalled \$10,533,068. Exports totalled \$9,270,091; imports \$7,866,492, duties on same being \$1,169,416.

Agriculture and Manufactures.—How well justified was Governor Maybank's attack on farm tenancy is shown by the fact that two-thirds of the farmers are tenants, a fourth of whom move annually. In several counties there are few white tenants, although generally both races are heavily represented. Federal authorities estimated 1939 production of South Carolina crops exceeded 1938 by 12%. Value of principal field and truck crops 1939, \$117,686,000, as against \$98,627,000 in 1938. Cotton yield per acre and total yield of wheat, oats, hay, tobacco, sweet potatoes exceeded all records. Farmers voted in December over 96% for Federal marketing quotas of cotton to continue in 1940. Over 1,000,000 ac. are of forests under public supervision.

Capital in all manufacturing plants June 30, 1939, was \$393,762,649; value of products fiscal year ending that date \$382,290,041; average number of employees 133,048; wages (not including salaries) \$88,365,782. The Santee-Cooper hydro-electric and navigation dam being built by a Federal grant of \$37,500,000 got well under way. (D. D. W.)

South Dakota, North Central State, admitted to the Union in 1889, is commonly called the "Coyote State." Area, 77,615 square miles. Population (1935 State census), 675,082. Capital, Pierre, population 4,013. Chief city, Sioux Falls, population 33,644. Urban population, 289,751. Rural population, including 26,996 Indians, 385,331.

History.—Republicans gained complete control of State administration, one U.S. senatorship, and the State's two Congressional members. State legislature met in 26th regular session, 1939; adopted new code, enacted capital punishment law, blood test before marriage bill, basic science law, soldiers' preference law; proposed three amendments to State Constitution to be voted on at Nov. 1940 election; 300 laws passed. Harlan John

Bushfield, 16th governor, inaugurated, Jan. 3, 1939.

Statistics.—The school census for 1939 was 163,440; school enrolment, 139,014. The State debt was \$44,869,000 on June 30, 1939. Total receipts \$31,251,385.25; disbursements, \$30,761,339.34. The total value of crops produced in 1939 was \$75,422,000; mineral production was in excess of \$20,000,000. There were no bank failures in 1939.

A continuation of drought and grasshopper plague brought distress to farmers over a wide area. The farm-to-town migration continued. Manufacturing showed a slight gain.

Highway development continued to be one of the State's principal industries. An estimated 1,000,000 out-of-State tourists visited the Badlands and Black Hills in 1939. (L. K. F.)

Southern Rhodesia: *see* RHODESIA.

South Polar Regions: *see* EXPLORATION AND DISCOVERY.

South Sea and Equatorial Islands. Howland island, in the Pacific ocean, lies in latitude 0°49' N., longitude 176°42' W., approximately 1,620 mi. south-west of Honolulu, Territory of Hawaii. It was discovered by Capt. George E. Netcher of New Bedford, Mass., in 1842, and taken possession of by the United States in Feb. 1857, by A. C. Benson of the American Guano Company. In 1872, the "U.S.S. Narragansett" surveyed Howland island and found it to be about two miles long, north and south, one-half mile wide, 18 or 20 ft. high, of coral formation, and with a fringing reef. Baker island lies in latitude 0°13' N., longitude 176°33' W., within 13 nautical miles of the equator. Jarvis island is approximately 1,500 mi. south of Honolulu, Territory of Hawaii—latitude 0°22'37" S., longitude 160°01'37" W. It is 23 mi. south of the equator, is of sand and coral formation; 1.9 miles east and west by a little over a mile wide. It is saucer-shaped, the high beach rim enclosing a basin. These three islands were settled in 1936, after having been uninhabited for many years, by representatives of the Department of the Interior, and colonized by placing four young Hawaiians on each island. Their presence there definitely established the sovereignty of the United States to these islands and permitted the recording of meteorological data essential to commercial aviation in the Pacific.

In March 1938, Canton and Enderbury islands of the Phoenix group were similarly colonized and likewise placed under the Interior Department by Executive Order. Canton island is the largest and most northerly of the Phoenix islands. Its position is 2°49' S., 171°43' W. It is a coral atoll composed of a nearly continuous narrow rim of land from 50 to 600 yd. wide, enclosing a triangular lagoon about 8 mi. long by nearly 4 mi. wide at the west end. This rim varies in height from 10 to 20 ft. and is broken only by three or four lagoon entrances. The construction of local facilities by Pan American Airways is nearing completion. Test flights from Hawaii to New Zealand, using Canton as the first stop of the southward flight, were made during the year. Regular service is shortly to be scheduled. Enderbury island lies about 36 miles in the direction S. 67° E. from Canton, its position being 3°7' S., 171°3' W. It is of sand and coral formation, about 3 mi. long north and south by about a mile wide. The rim averages 15 to 20 ft. high. All these islands are of coral formation with scarcely any vegetation, and all are devoid of drinking water and afford no means of subsistence. It is necessary therefore to furnish all food, drinking water, and incidental supplies for the maintenance of the colonists. This is accomplished by sending quarterly expeditions to the islands from Honolulu. (E. GRU.)

South-West Africa: *see* MANDATES; SOUTH AFRICA, THE UNION OF.

Sovereigns, Presidents and Rulers.

The following list includes the names of those holding chief positions in their countries on Jan. 1, 1940.

Country	Name and Office	Accession
Afghanistan	Muhammed Zahir Shah, King	1933
Arabia, Saudi	Abdul Aziz ibn Saud, King	1927
Argentina	Roberto M. Ortiz, President	1938
Australia	Lord Gowrie, of Ruthven, Governor-General	1936
	Robert G. Menzies, Premier	
Belgium	Leopold III, King	1934
	Hubert Pierlot, Premier	
Bhutan	Yigme Wangchuk, Maharaja	1926
Bolivia	Gen. Carlos Quintanilla, Provisional President	1939
Brazil	Dr. Getulio Vargas, President	1934
Bulgaria	Boris III, King	1918
	George Kiussévanoff, Premier	
Canada	Lord Tweedsmuir, Governor-General	1935
	W. Mackenzie King, Premier	
Chile	Pedro Aguirre Cerda, President	1938
China	Lin Sen, Chairman of National Gov't.	1932
	Gen. Chiang Kai-shek, President of Yuan	1939
Colombia	Dr. Eduardo Santos, President	1938
Costa Rica	Léon Cortés, President	1936
Cuba	Dr. Federico Laredo Bru, President	1936
Denmark	Christian X, King	1912
Dominican Rep.	Dr. Jacinto B. Peynado, President	1938
Ecuador	A. F. Cordova, Provisional President	1939
Egypt	Farouk I, King	1936
	Aly Maher Pasha, Premier	
Eire	Dr. Douglas Hyde, President	1938
	Eamon de Valera, Premier	
Estonia	Konstantin Päts, President	1933
Finland	Kyosti Kallio, President	1937
France	Albert Lebrun, President	1932
	Edouard Daladier, Premier	
Germany	Adolf Hitler, Fuehrer and Chancellor	1933
Great Britain	George VI, King and Emperor	1936
	Neville Chamberlain, Prime Minister	
Greece	George II, King	1935
	Gen. John Metaxas, Premier	
Guatemala	Gen. Jorge Ubico, President	1931
Haiti	Stenio Vincent, President	1930
Honduras	Gen. Tiburcio Carias Andino, President	1933
Hungary	Admiral Nicholas Horthy, Regent	1920
	Count Paul Teleki, Premier	
Iceland	Christian X, King	1912
India	Marquess of Linlithgow, Viceroy, Governor-General	1936
Iran	Reza Shah Pahlavi, Shahinshah	1926
Iraq	Faisal II, King (Regency)	1939
Italy	Victor Emmanuel III, King	1900
	Benito Mussolini, Premier, Chief of Gov't, Sec'y of State	
Japan	Hirohito, Emperor	1926
	Nobuyuki Abe, Premier (resigned Jan. 14, 1940)	
Latvia	Karlis Ulmanis, President	1936
Liberia	Edwin Barclay, President	1931
Liechtenstein	Franz Josef II, Sovereign Prince	1938
Lithuania	Antanas Smetona, President	1926
Luxemburg	Charlotte, Grand Duchess	1919
Manchoukuo	Henry Pu Yi, Emperor Kangte	1934
Mexico	Gen. Lázaro Cárdenas, President	1934
Monaco	Louis II, Prince	1922
Morocco	Sidi Maulay Mohammed, Sultan	1927
Nepal	Maharaja Bir Bikram Jang, King	1911
Netherlands	Wilhelmina, Queen	1890
Newfoundland	Sir Humphrey T. Walwyn, Governor	1936
New Zealand	Viscount Galway, Governor-General	1935
	Michael J. Savage, Premier	
Nicaragua	Gen. Anastasio Somoza, President	1937
Norway	Haakon VII, King	1905
Oman	Sayyid Said bin Taimur, Sultan	1932
Palestine	Sir Harold Alfred MacMichael, High Commissioner	1938
Panama	Dr. Augusto S. Boyd, President	1939
Paraguay	José Estigarribia, President	1939
Peru	Dr. Manuel Prado, President	1939
Philippines	Manuel Quezon, President	1935
Portugal	Gen. Antonio Carmona, President	1926
	Dr. Antonio Salazar, Premier	
Rumania	Carol II, King	1930
	George Tatarescu, Premier	
Russia	Mikhail Ivanovich Kalinin, President	1936
	Joseph V. Stalin, Communist Secretary	
Salvador, El	Gen. Maximiliano H. Martínez, President	1935
Siam (Thailand)	Ananda Mahidol, King (Regency)	1935
	Col. Luang Bipula Songgram, Premier	
Slovakia	Josif Tiso, President	1939
South Africa	Sir Patrick Duncan, Governor-General	1936
	Gen. Jan C. Smuts, Premier	
Spain	Gen. Francisco Franco, Head of Gov't, Prime Minister	1939
Sudan	Sir George S. Symes, Governor-General	1933
Sweden	Gustaf V, King	1907
Switzerland	Dr. Marcel Pilet-Golaz, President	1940
Syria, Lebanon	Gabriel Puaux, High Commissioner	1938
Trans-Jordan	Abdullah ibn Hussein, Amir	1928
Tunis	Sidi Ahmed II, Bey	1929
Turkey	Ismet Inonu, President	1938

Country	Name and Office	Accession
United States	Franklin D. Roosevelt, President	1933
Uruguay	Gen. Alfredo Baldomir, President	1938
Vatican City	Pius XII, Pope	1939
Venezuela	Gen. Eleazar López Contreras, President	1935
Yugoslavia	Peter II, King (Regency)	1934
Zanzibar	Seyyid Sir Khalifa bin Harub, Sultan	1911

Soviet-German Pact: see CHINESE-JAPANESE WAR; COMMUNIST PARTY; EUROPEAN WAR; FRANCE; GERMANY; GREAT BRITAIN; ITALY; MOLOTOV, VYACHESLAV MIKHAILOVICH; RIBBENTROP, JOACHIM VON; UNION OF SOVIET SOCIALIST REPUBLICS.

Soviet Republics: see UNION OF SOVIET SOCIALIST REPUBLICS.

Soviet Union: see UNION OF SOVIET SOCIALIST REPUBLICS.

Soybeans. One of the two bumper crops of 1939 in the United States was soybeans; the other, tobacco. Soybean acreage planted, crop harvested and yield per acre were all larger than ever before. Prices were up sharply, owing to war-made demand for fats and oils in Europe and the smaller supply available from Manchoukuo because of transportation difficulties and the war in China. Acreage harvested for beans, 3,868,000ac., was nearly half the acreage planted and the crop was 79,689,000 bushels. The bean crop acreage in 1938 (not including hay crop) was 2,898,000ac. and production 57,665,000 bushels. Yield in 1939 was 20.6bu. per acre; 19.5 in 1938. Prices after the beginning of war ranged about 10¢ a bushel higher than wheat in Chicago where there was very active trade in soybean futures on the Board of Trade as well as in the spot market, Scandinavian steamers coming to Chicago for cargoes, and 8,619,000bu. being shipped out between October 1 and November 17. A bushel of soybeans weighs the same as wheat, 60 pounds. (See also CHEMURGY.)

Soybean Production by States, 1938 and 1939

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
Illinois	43,080,000	31,866,000	Louisiana	216,000	178,000
Indiana	12,422,000	8,404,000	Pennsylvania	186,000	105,000
Iowa	9,093,000	5,733,000	Kentucky	180,000	168,000
Ohio	7,854,000	5,313,000	Maryland	130,000	150,000
North Carolina	2,133,000	2,015,000	Alabama	114,000	99,000
Michigan	880,000	560,000	South Carolina	112,000	91,000
Missouri	650,000	609,000	Georgia	93,000	78,000
Mississippi	612,000	476,000	Kansas	64,000	63,000
Arkansas	484,000	440,000	New York	42,000	34,000
Delaware	418,000	400,000	Oklahoma	24,000	26,000
Virginia	375,000	262,000	Texas	16,000	15,000
Wisconsin	261,000	112,000	West Virginia	12,000	12,000
Tennessee	238,000	256,000			

(S. O. R.)

Spain, since March 29, 1939, a totalitarian State; area 194,200 sq.mi. (including Balearic and Canary islands); pop. (est. Dec. 31, 1936) 25,050,000. Chief towns (pop. 1934): Barcelona 1,148,000; Madrid 1,048,100; Valencia 353,000; Seville 238,750. Caudillo, or Chief of State: General Francisco Franco; language: Spanish; religion: Christian (mainly Roman Catholic).

History.—(For the war in Spain, see SPAIN, CIVIL WAR IN.) The outstanding event of 1939 in Spain was the end of the Civil War, in March. The remainder of the year was marked by the reconstruction of the political and economic framework along totalitarian lines and by unspectacular measures for repairing the ravages of more than two-and-one-half years of war.

With the collapse of the Republican Government in Madrid, General Francisco Franco, as head of the victorious F.E.T. (*Falange Española Tradicionalista*, or *Spanish Traditionalist Phalanx*), held undisputed control in Spain. Already Great Britain and France had recognized the new regime (Feb. 27), and on April 1 a similar declaration was made by the United States.

Immediately upon the occupation of Madrid, General Franco set about to remedy the serious food shortage existing especially in Madrid and other newly-conquered regions. In the capital city, some 1,500,000 rations were being distributed daily at the begin-

ning of April by the Phalangist women's auxiliary, which has many social-welfare responsibilities in Nationalist Spain. In June, the issue of food cards was begun and stringent measures were taken against hoarding and profiteering. At the same time the Government moved to consolidate its control and maintain order. At Madrid and other erstwhile Republican centres, General Franco established military tribunals, before which Republican civil officials (who are liable to punishment either by property confiscation or imprisonment for a maximum of 15 years) and Republican soldiers were ordered to appear for investigation. Among those arrested was Don Julián Besteiro, 70-year-old former president of the Republican Cortes, who was sentenced to 30 years' imprisonment in July. Censorship of the press, mails and telegraph continued, and travel in the interior of Spain was forbidden without Government permission.

Meanwhile, as the country remained relatively at peace, except for a short-lived uprising in Asturias in June, the army was gradually demobilized. By the end of April many Moroccan soldiers had been repatriated, and by early June all German, Italian and Portuguese troops had left Spain, except for a few technicians and liaison officers. Already, according to Government statement, 250,000 men had been demobilized since the end of the Civil War. The demobilization of a further 150,000 was ordered for June, and the remaining 200,000 were to constitute Spain's standing army. Economic reconstruction was a primary concern of the new Spanish Government. In speeches made during a triumphal tour of the country, and in an address delivered at Burgos in June before the National Council of the F.E.T., General Franco announced a goal of national self-sufficiency, to be achieved by the reduction of imports and the intensification and diversification of industry. With respect to foreign commerce, the Government adopted a bilateral-compensation or barter policy and rigidly controlled imports through State foreign exchange agencies. Development of the merchant marine and fishing fleets, an important part of the self-sufficiency program, was encouraged by the grant of a 750,000,000 peseta credit for loans to ship-builders, and a decree of October 24 authorized subsidies to industries of "national interest," on condition of Government participation in their management. Meanwhile, a plan for general economic recovery, involving especially unemployment relief and the construction of new and improved means of communication, had been formulated in a law of April 11, and, to accelerate the rebuilding program, all males between the ages of 18 and 45 were requisitioned for national service, in the form of either a labour or income tax. Social developments under the Franco régime consisted chiefly in the re-opening of churches which had been secularized by the Republican Government, and in changes in the universities and elementary schools.

In July, the Phalangists and Traditionalists, the allied groups composing the F.E.T., were reported in serious disagreement over the course to be followed in economic reorganization. Early in August a decree was published which modified the governmental structure and placed the Phalangist element in a position of political dominance. The decree pronounced all members of the army, navy and air corps to be eligible for affiliated membership in the F.E.T. and confirmed General Franco's absolute political authority, in the exercise of which the Caudillo "answers before God and before History." Under General Franco, and possessing important administrative and advisory powers, were the general secretary of the party, the national council (whose membership may vary between 50 and 75), and the *Junta Política*. Shortly after the issuance of the decree, the Government announced a new



ARMoured TANKS filling in review before Gen. Franco during his victory parade in Madrid May 19, 1939

cabinet, essentially a body of young men, with only one Traditionalist among its 14 members.

The foreign policy of the Franco Government was naturally influenced by the assistance which it had received from Italy and Germany, during the Civil War, and by the totalitarian structure of the new Spanish State. In the various parades in celebration of the Nationalist victory, the foreign legionaries were accorded a prominent place, and, before their departure from Spain, the Government announced (April 7) that it had joined the Anti-Comintern bloc. On May 9 Spain notified the League of Nations of its intention to withdraw. The activities of a Spanish mission to Italy in June and the visit of Italian Foreign Minister Count Ciano to Spain in July were closely followed by the Spanish press, which published, however, no official statement as to the results achieved. With Portugal, the third country to which Nationalist Spain is indebted for aid in the Civil War, the Government concluded a treaty of non-aggression and friendship on March 17 and, in December, a barter agreement contemplating a greatly increased volume of trade.

The circumstances of the Civil War created in Nationalist Spain a feeling of resentment toward the democracies of Great Britain and France, which was reflected both during and after the war by a sharp decline in the normally large trade with those countries. In April an accord was signed with France providing for the return of gold and other valuables, including war materials, which had been transported to France by Spanish Republicans. The slow execution of this agreement threatened further to strain Franco-Spanish relations, as did the violent assault by Spanish army officers on the French consul at Madrid (July 9), for which the Spanish Ambassador to France tendered his Government's apology. Relations between the two countries shortly improved, however, with the return to Spain of £8,000,000 of Republican gold (by the end of July) and of 9,000 cases of valuables in August. The repatriation of some 500,000 Spanish refugees in France also engaged the attention of the two Governments. Spain at first limited the number admitted daily, but gradually relaxed its restrictions, offering, in July, to repatriate 60,000 refugees and aid the French Government with the remainder. By December, all but an estimated 140,000 had been returned to Spain.

Considerable uneasiness was felt in Spain as a result of developments in European politics during the latter part of the year. The announcement, in August, of the Russo-German pact caused the Government some embarrassment, and the outbreak of the European war (with respect to which Spain declared her neutrality on September 4) dealt a severe blow to the country's reconstruction program and commercial policy. In 1938 and the first half of 1939 Germany had been the chief market for Spanish exports, as well as the principal foreign source of supply, and the closing of this trade seriously impaired Spain's immediate capacity to rehabilitate industry and transportation, since many industries were faced with a lack of essential equipment which they had ordered or planned to order from Germany. In this situation, the Spanish Government opened trade conversations with Great Britain and France. In December, the Anglo-Spanish conferences were declared to be proceeding satisfactorily, although high Spanish prices were causing some difficulties. Negotiations with France broke down suddenly on December 20, after the near completion of a 600,000,000 franc bi-lateral compensation agreement, but were expected shortly to be resumed.

Banking and Finance.—The financial structure has been severely shaken by the losses in the gold reserve and by the increase of the internal debt, mostly in the form of issues of paper currency; the amount of this currency, although unrevealed, is probably very large, but there have been no internal bond issues or closing of banks. There is no funded foreign indebtedness, but

commercial obligations amounting to more than \$50,000,000 were contracted and blocked before the outbreak of the Civil War, and other heavy obligations, of undisclosed amount, were contracted during the war by the present Government, especially with Italy. The peseta dropped from 10.35 to the dollar before the European war to 12.55 to the dollar on December 9. A Government decree releasing some 3,500,000 Republican pesetas which had been impounded during the Civil War created fear of further inflation. (See also ARMIES OF THE WORLD; EUROPEAN WAR; MINORITIES; RELIGION; SOCIALISM.)

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(C. E. CH.; R. H. SH.)

Spain, Civil War in. By March 29, 1939, all Spain lay in the hands of Nationalist General Francisco Franco, and the Spanish Civil War, after two years and 254 days of bitter fighting, was finally at an end. The triumph of the insurrectionaries was the result largely of material superiority and foreign aid. From both Italy and Germany, General Franco received a continual flow of war necessities. In addition to technicians, planes and submarines, Germany contributed the Condor legion, a German army unit numbering some 15,000 men. Italy (according to the *Forze Armate*, an official publication of the Italian army and navy) transported 100,000 troops to Spain between mid-Dec. 1936 and mid-April 1937, sent an air force of more than 6,000 men and supplied General Franco with 4,370 tanks, trucks and automobiles, 750 cannon and 40,000 tons of ammunition. Portugal also aided the Nationalist cause, providing some 10,000 men (according to the Portuguese press). The Republican Government's chief foreign source of war materials was distant Russia, from which, because of the circumstances of the war, shipments could usually be received only over the Pyrenees, while even this channel of communication was not always allowed to remain open by the French Government. Besides its inferiority in war materials, the Republican Government had to contend also with a constantly diminishing food supply and internal dissension, while the Nationalists enjoyed both political harmony and a condition of comparative plenty. The campaigns which brought the fall of Barcelona in January and Madrid in March 1939 were but military incidents in a struggle whose outcome already was evident from the disparity between the material resources of the contending sides.

By Dec. 1938, having massed along the Ebro front some 300,000 troops, a huge armada of German and Italian planes and batteries of 9-in. guns, General Franco was ready to deliver a decisive blow. Two days before Christmas, the Nationalists opened their campaign with a terrific bombardment, and drove rapidly across the Segre river, at the same time advancing upon Tortosa in the south. The capture of Borjas Blancas (Jan. 5, 1939) and Montblanch (January 11) threatened to cut off the Republican forces in southern Catalonia and led to the fall of Tortosa on January 13. The Republicans ordered to the front all able-bodied men between the ages of 20 and 45, militarized all supplementary war industries and food agencies, and began a counter-attack on the Madrid front, near Brunete—but to no avail. From the south-west and the north-west the Nationalists pressed hard upon Tarragona, capturing the city, along with Reus, on January 15, after having earlier forced the withdrawal of Republican troops from southern Catalonia. On January 26 Barcelona fell, almost without resistance.

On February 1, before 62 members of the Republican Cortes meeting at Figueras, Premier Negrín delivered an address urging that the fight be continued in Central Spain if Catalonia were conquered. Meanwhile the Nationalists pressed toward the frontier,



CIVILIAN REFUGEES of Loyalist Spain in the Pyrenees near Olot after the fall of Barcelona Jan. 26, 1939

entering the border towns of Puigcerdà, Le Perthus and Cerbère on February 10, with which military operations virtually ceased. Already President Azaña, Premier Negrín and other Government members had crossed into France, along with hundreds of thousands of military and civilian refugees.

The Civil War now moved rapidly to a close. Accorded the recognition of Great Britain and France on February 27, shortly followed by that of other countries, General Franco concentrated his forces outside Madrid, which, with the return of Premier Negrín and his cabinet on February 12, had been re-established as the capital of Republican Spain. Meanwhile events within Madrid presaged the collapse of further Republican resistance. With the announcement on February 27 of President Azaña's resignation, Premier Negrín took over control of the Republican army from General Miaja. This was his last important act as prime minister. On March 6, a National Council of Defence, headed by General Miaja, overthrew the Negrín Government, whose members escaped to France, and assumed control of Republican Spain. This new move, for which motives were rather obscure, was followed on the 7th by a revolt of Communists and supposed adherents of the ousted premier—the second rising against the Republican Government, which had faced an Anarcho-Syndicalist insurrection in Catalonia in May 1937. By March 13 the revolt had been put down, after heavy fighting, and the Defence Council turned its efforts to the securing of an honourable peace.

Between March 19 and 26 negotiations by radio and personal interview were conducted with General Franco, who, aside from ordering the blockade of all Republican ports, had remained inactive while his opponents fought among themselves. The Nationalist commander demanded unconditional surrender. The Republicans insisted upon the safe evacuation of certain of their leaders. A deadlock ensued, and on March 26 General Franco opened an offensive in the Toledo and Córdoba sectors which proved to be the final blow. On March 27, Almadén fell and the Republican air force surrendered, and on the next day 200,000 Nationalist troops, meeting no resistance, entered Madrid, from which the Government had already fled. Twenty-four hours later nearly all the provincial capitals were in General Franco's hands,

and on March 29 at 2:20 p.m. the Spanish Civil War was officially pronounced to be at an end. (See also ARMIES OF THE WORLD; INTERNATIONAL LAW; ITALY: *History*; LIGHTNING WAR; RELIGION; SHIPPING, MERCHANT MARINE.)

(C. E. CH.; R. H. SH.)

Spanish-American Literature. Recent "ideologies" have caused in Spanish America a state of great activity. Governments have entered the field of publication, thus offering the creative forces of every country an opportunity for expression. Besides, the economic and political conditions now existing in the Old World are displacing to the New the centres of Western culture. This is most significant. A new era has commenced for Spanish America. From Germany, Austria, Poland, Russia, Italy and Spain a good number of scientists, philosophers, educators, artists and workers have migrated to Buenos Aires, Mexico City, Montevideo, Santiago, Habana, Bogota. And so have the great publishing houses of Spain. Buenos Aires is rapidly becoming the literary centre of the Spanish world. Espasa-Calpe, Editorial Lozada, Editorial Tor and others now in the Argentinian capital are offering in increasing numbers the world classics of yesterday and of today and are stimulating literary production to an amazing degree. In Spanish America authors now find publishers for their books without having to go to Paris or Madrid, and the book market is being organized for the first time in history.

Generally speaking, the essayists, novelists and poets of Spanish America, whether they belong to the "right" or to the "left," seem to share a common interest and a common desire: to study and to understand Spanish American realities and point to their significance and their values. The essayists lead the group, now surveying the economical, political, racial and social conditions in their countries, as Mariano R. Tissebaum in *El nivel de vida* (the standard of life in Spanish America in its relations to wages), Obdulio Pulido in *Voz alta* and Ramón Díaz Sánchez in *Transición* (studies on Venezuelan conditions), Moisés Sáenz in *México íntegro* and José Vasconcelos in *El Proconsul* (masterful comments on modern Mexico in its struggles to conquer itself), Juan Luis Merchán in *De donde vienen los negros* (scholarly discussion on the origin of the African peoples that were brought

to the Antilles) and Anténor Orrego in *El pueblo continente* (an original interpretation of the Spanish American soul); now presenting the lives and characters of leading personalities, without failing to comment on the environment in which they lived and acted, as Luis Alberto Sánchez in *Garcilaso Inca de la Vega*, Germán Arciniegas in *Jiménez de Quesada*, Julio Jiménez Rueda in *Juan Ruiz de Alarcón y su tiempo*, Juan Pablo Echagüe in *Seis figuras del Plata*, Manuel Gálvez in *Vida de Hipólito Yrigoyen* and F. Cossío del Pomar in *Haya de la Torre, el Indoamericano* (a sympathetic view of the leader of the revolutionary party of contemporary Peru); now criticizing the present conflicting "isms" that aim to control the world of politics and defending the traditions and institutions of Spanish America, as Rafael Arévalo Martínez in *Viaje a Ipanema*, Moisés Vincenzi in *Marx en la fragua*, Alberto Zum Felde in *El ocaso de la democracia*, Francisco E. Padilla in *Democracia y totalitarismo*, Francisco Núñez in *De Hegel a Stalin* and Vicente Dávila in *Problemas sociales*; and finally, aiming to find the path that Spanish America must follow to protect its great future, as Julio E. Moreno in *Humanidad y espiritualidad*, Enrique Molina in *De lo espiritual de la vida humana*, Jorge Roa in *Biología social*, and above all Luis López de Mesa in *Disertación sociológica*, the most comprehensive, bold, profound and brilliant essay ever written about the origin, evolution and destiny of culture in Spanish America.

Pure prose fiction does not seem to have attracted special interest among Spanish American writers in 1939. High quality production did not keep up the standards of the immediate past. We have noticed: *Cantares y tradiciones del Tucumán*, by Juan Alfonso Carrizo, *Los payasos poetas del pueblo*, by Armando de María y Campos, *Medallas antiguas*, by Juan María Ravelo and *Cosas de mi pueblo*, by J. M. Fernández Consuegra, among the writings of folkloric nature; *Agua salada*, by José Fabiani Ruiz, *Camino Real*, by Juan Bosch, *Guaraníes*, by Martín de Goycochea Menéndez and *Antología del verdadero cuento chileno*, ed. Miguel Serrano, among the realistic short stories, and 20 cuentos, by José Restrepo Jaramillo, *La sombra alucinante*, by Angélica Palma, *Mies tardía*, by Genaro Fernández Mac Gregor, *Cuentos del México antiguo*, by A. del Valle Arizpe, *Sueños para la infancia del mundo*, by Félix M. Pelayo, *Cuentos en el primer solsticio*, by Matías Milla Solsona, *Mirador*, by José G. Montes de Oca and *Germinal* by Marcos Caria Reyes, among the collections of stories

of pure fantasy, even if at times with a background somewhat realistic.

The novel followed in 1939 the trends of the immediate past: *Huasteca*, by Gregorio López Puentes; *La monja de la revolución*, by Ricardo I. Vasquez; *Liberación*, by Arturo Mejía Nieto; *El estanque*, by Dora de Aguirre; *El puño del amo*, by Gerardo Gallegos; *Regina Landa*, by Mariano Azuela; *Resaca*, by César Carizurieta, and *Noviembre* by Humberto Salvador, are novels depicting social and political conditions in Mexico, Honduras, Venezuela and Ecuador. Juan Marin, the famous author of *Paralelo 53, Sur*, wrote in *Nafragio* and in *Orestes y yo* two psychological novels of intense interest, and Maria Luisa Bombal in *La amortajada* a strange and powerful symbolical narrative.

True to its well established tradition for excellence, Spanish America produced in 1939 a great number of poetic works of various nature and tendency: Carmen Alicia Cadilla published her *Canciones en flauta blanca*, childlike, delicate, exquisite; Lucia Victoria Goitea her *Ensueño y realidad*, erotic, pantheistic; Rogelio Sotela his *Apología del dolor*, simple, spontaneous, sentimental; Antonio Arraiz his *Cinco sinfonías* and *Aspero*, noble and sympathetic verse written in defence of the Venezuelan Indians; Isa Caravalló her *Vendimia de huracanes*, restless, impassioned and courageous defence of the Cuban proletariat; Eugenio Florit his *Doble acento*, romantic, exquisite; Alberto Hidalgo his *Dimensión del hombre*, pure, spiritual, classic; María Raquel Adler her *Sonetos de Dios* and *Buenos Aires, ciudad y poesía*; Edgardo Ubaldo Genta his *La epopeya de América*, first canto of an ambitious epic promised by the inspired Uruguayan; Osvaldo Bazil his *La cruz transparente*, intimate, highly subjective and artistic; and Carlos García-Prada his *Luz que flota en el Olvido*, a precious selection of sonnets by 33 Colombian poets in which are to be found some of the most beautiful ever written in the Castilian language, and the song of a nation—Colombia—so distinguished for its poetic expression.

(C. G.-P.)

Spanish Colonial Empire. Total area (approx.) 322,300 sq.mi.; total population (est. Dec. 31, 1937) 26,055,000.

The following table lists the colonies, protectorates, etc., of Spain together with certain essential statistics appropriate to each of them, including the mother country itself:

Country and Area sq.m. (approx.)	Population Estimated Dec. 31, 1937 (ooo's omitted)	Capital, Status, etc.	Principal Products (in metric tons)	Imports and Exports (in thousand pesetas)	Road, Rail and Shipping	Revenue and Expenditure (in thousand pesetas)
Spain, including Canary Is., and Balearic Is., 194,200.	25,050	Madrid, republic, President: General Francisco Franco Behamonde				
AFRICA Ceuta and Melilla, 77	115	—, administered as part of Spain.	exports (1934) raw materials 899,553, manufactures 12,892	(1934) imp. 47,546 exp. 14,500		
Morocco, Spanish, 8,080	750	Tetuan, protectorate High Commissioner: General Carlos Asensio	(1936) iron ore (metal content) 579,000; (1934) antimony ore (metal content) 314	(1936) imp. 60,600 exp. 26,700	rds. c. 500 mi. rly. 80 mi.	(1936) rev. and exp. 50,271
Spanish Guinea, including Fernando Po, Rio Muni and four small islands, 10,380	120	Santa Isabel, colony.	(1934-35) cocoa 14,900 coffee	(1930) imp. 17,625 exp. 21,970		(1932) rev. and exp. 11,020
Western Sahara, including Ifni, Rio de Oro, and Spanish Sahara, 109,600 .	20	Villa Cisneros, colonies.	fish and dates			(1929) rev. and exp. 6,947

Spanish Guinea: *see* SPANISH COLONIAL EMPIRE.

Spanish Morocco: *see* SPANISH COLONIAL EMPIRE.

Spanish West Africa: *see* SPANISH COLONIAL EMPIRE.

Spelman Fund of New York was chartered in 1928. The Fund, during 1939, continued its program directed at the improvement of the methods and techniques in the field of public administration. Support was extended to public and quasi-public agencies engaged in circulating information regarding advances in administrative practice, in developing new types of organization and operating methods, and in actually installing administrative improvements in governmental agencies. During the year, the Fund appropriated \$886,500.

The Chairman of the Board of Trustees is Charles E. Merriam; the Executive and Secretary, Guy Moffett. (G. M.T.)

Spices. Three important occurrences marked the year 1939: (a) Pepper trading on the Produce Exchange of New York attained impressive volume, making that city the dominant pepper market of the world; (b) Because it consumes annually 50,000 tons of spices the change of food laws (June 25) of the United States will affect quality and labelling everywhere; (c) A war market began September 1 and excited activity continued about 30 days, when suggestions of peace caused prices to react. Mounting ocean freight rates and war risk insurance accounted for some advances.

By October 25, 75% of the rise had vanished.

Madagascar controlled the clove market as Zanzibar sellers preferred not to meet competition. As the year drew to a close, this situation was reversed and large sales by Zanzibar were made to all markets.

The war in China did not stop shipments of cassia, although prices were higher, reflecting the increased cost of transportation by land and sea. Adequate quantities continued to come to the principal consuming markets. There was marked improvement in cassia quality through protection of the bark against deterioration, better drying and cleaning.

Gingers on a gold basis reached an historic all-time low, the Sierra Leone variety selling during the spring of 1939 at parity with \$1.95 per 100lb. which price included transportation to steamer, bags, insurance, and ocean freight to New York. Sellers of India and Jamaica gingers had to reduce their prices to comport with the lower value established in Africa. The increased production of nutmegs in the island of Grenada was well absorbed by the London and New York markets. Prices moved about 35% above the figure at which the 1939 market opened.

Since Jan. 1939, the black pepper market has fluctuated within a range of 1½¢ per pound. It sold for a short time at 3¢ per lb. c.i.f. New York. As of October 1, there were in New York warehouses 627,281 bags of Lampong black pepper, sufficient with manufacturers' stocks to meet U.S.A. requirements for about 3½ years. This heavy accumulation resulted from speculative desire to hedge against possible monetary inflation. As the year closed, stocks of black pepper in New York warehouses stood at 647,666 bags, up 100,734 bags from Dec. 31, 1938. The crop considerably exceeded estimates, amounting to 42,000 tons.

Mustard Seed.—Consumption appeared to be increasing. The improved qualities of mustard products in countries of large population accounted for much of this. A high market prevailed from September as the usual supplies from Poland and Germany became unavailable. The Netherlands embargoed its bountiful 1939 crop and England may not thresh its harvest until spring, 1940. Acreages elsewhere are likely to be increased for the 1940 crop, notably in Denmark, California and Montana.

Spain and Hungary have placed paprika (1939 crop) under strict Government control. Prices are much higher than the opening figures for the previous crop. Other countries are responding elatedly to this strong incentive to increase their paprika acreages. (C. A. T.)

Spingarn, Joel Elias (1875–1939), U.S. educator and author, was born in New York city on May 17 and was educated at Columbia university, where he received his doctorate of philosophy in 1899, and at Harvard. From 1899 to 1911 he taught comparative literature at Columbia; in the latter year he purchased the *Amenia* (N.Y.) *Times*, of which he was publisher for the next 15 years. During the World War (1914–18) he was major of infantry in France. When he returned he helped found the publishing firm of Harcourt, Brace & Company and was for many years its literary adviser. He also founded a movement for rural recreation, was a director of the Horticultural Society of New York, and president of the National Association for the Advancement of Colored People. In 1913 he established the Spingarn medal for "highest achievement . . . in any honourable field" by an American citizen of African descent. The 1938 medal was awarded to Marian Anderson, Negro singer. Spingarn was the author of many volumes on the history of literature, literary criticism, poetry and horticulture. He died at New York city on July 26.

Spirits: *see* LIQUORS, ALCOHOLIC.

Squash Racquets. Squash racquets welcomed a notable veteran player as national champion when Donald Strachan, of Philadelphia, won his way to the title which he held in 1936. In the three intervening years Germain G. Glidden, of New York, wore the crown and retired as undefeated champion. Strachan, who exhibited excellent court strategy, defeated Stanley Galowin, of New York, in three straight games in the finals, although the latter team was successful in winning the New York State title.

The contest for the national doubles championship was a particularly keen one, with the winning team of Hunter H. Lott and William S. Slack, of Philadelphia, retaining their title by beating Galowin and Fred Alexander. Another exciting exhibition was displayed in the Metropolitan doubles championship, won by Don Nightingale and Sam Cochrane, of the University club, in turning back the defending champions, Beekman H. Pool and Conway Hoffman. Bernard H. Ridder, Jr., of the University club is the Metropolitan singles class A champion.

The competition for the national professional championship is always watched with unusual interest by players and followers of the game, who were quick to acclaim the successful New Yorker, Les Cummings, instructor of the Union club. He won the title in Cleveland, defeating Jack Summers, the coach of Massachusetts Institute of Technology.

Among collegians, the best in the field was Stanley W. Pearson, Jr., of Princeton university, winner of the national intercollegiate crown, and the University club's intercollegiate invitation singles tourney for the second straight year.

Showing her superiority in the game, Miss Anne Page, of Philadelphia, became the women's national champion for the third time (also in 1936 and 1937), defeating Miss Elizabeth Pearson, of Philadelphia. A strong duo came to the fore in the women's national championship, won by Mrs. John Bierwith and Mrs. William H. Adams, of New York. Mrs. Ary J. Lamme, Jr., won the Metropolitan singles championship class A, for the fourth time, and the New York State singles title for the second year.

(J. B. P.)

Stalin, Joseph Vissarionovich (1879–), Russian statesman and general secretary of the Communist party of the U.S.S.R., was born in Georgia and succeeded Lenin as virtual dictator of the Soviet Union in 1924 (see *Encyclopædia Britannica*, vol. 21, p. 301). Stalin startled the bulk of his countrymen and most of the world by his sudden reversal of Aug. 21, 1939, when announcement was made in Berlin that the U.S.S.R. would sign a ten-year pact of non-aggression with Germany. In retrospect, Stalin had first indicated this momentous shift March 10 when, in his opening address before the 18th Congress of the Communist party at Moscow, he accused France and Great Britain of wishing to foment a war between Russia and Germany. The second indication was the announcement on May 3 that Maxim Litvinov, a bitter anti-Fascist, had been dismissed as foreign commissar and replaced by V. Molotov (*q.v.*), who as Stalin's mouthpiece declared on May 31 that Russia would not sign a pact with the Allies unless all countries on its western frontier were guaranteed—a difficult condition for France and Britain to fulfil.

Stalin issues few public pronouncements, and the trends of his policy must be garnered mostly from the statements of subordinates and from the Soviet press. A flood of conjecture concerning the effects of the non-aggression pact followed its announcement. Upon one point, however, most observers agreed: that Stalin had temporarily strengthened the international position and security of Russia at the expense of the Comintern and, as events turned out, at the expense of peace in Europe. (See also UNION OF SOVIET SOCIALIST REPUBLICS.)

Stamp Collecting: see *PHILATELY*.

Standards, National Bureau of. This bureau, established by Act of Congress March 3, 1901, is part of the Department of Commerce. Its services in the fields of research, testing and commercial standardization are available to the National and State Governments without charge, and under certain conditions to the general public. The bureau is made up of the following divisions: electricity, weights and measures, heat and power, optics, chemistry, mechanics and sound, organic and fibrous materials, metallurgy, clay and silicate products, simplified practice, trade standards, and codes and specifications.

The regular staff on June 30, 1939, consisted of 950 employees and 80 research associates. The appropriation for the fiscal year 1939 was \$2,615,000, including \$500,000 for the construction and equipment of a new high-voltage laboratory and \$198,000 for continuing the investigation of building materials and structures for low-cost housing.

As part of the international program for the redetermination of the values of the electrical units on an absolute basis, new values for the ohm and ampere have been reported, but developments in Europe make it uncertain as to when these new values for the units will be adopted. The 29th National Conference on Weights and Measures, which met at the bureau in June 1939, went on record as favouring the quantity standardization of packaged food.

Testing of railroad track scales and of motor-truck scales has been continued, the railroad track scales showing the highest percentage (84.2) of scales within tolerance thus far recorded.

The radio sonde or radio weather recorder, developed by the bureau, has been put into regular use by the Navy, weather bureau and other Government agencies. Because of its low cost and its availability even in bad weather, it has supplanted aeroplane flights as a means for recording upper air conditions.

The bureau's part in the international research on the properties of steam was completed, and the results are being combined with those from other laboratories to serve as the basis for more precise steam tables.

Certain petroleum hydrocarbons are being studied so as to obtain the information needed for synthesizing the best possible fuel for aviation engines.

As a by-product of ruling fine linear scales, a small and sensitive diamond tool has been developed for measuring the hardness of glass and many other materials.

The Munson and Walker table for determining reducing sugars was revised to make it more readily applicable to samples of synthetic molasses now being imported in increasing quantities.

Many radium preparations were tested, including 377 with a radium content of 2,940mg. for the National Institute of Health. These were part of a lot of 9g. of radium, the largest single shipment ever received by the bureau.

An important discovery is the fact that the new synthetic material, neoprene, is less permeable to hydrogen, helium and carbon dioxide than ordinary rubber, thus making it particularly suitable for the gas cells of airships.

Several improved analytical methods have been developed for ferrous and non-ferrous metals and for gases.

In co-operation with the Bureau of Public Roads a new "Federal yellow" colour was developed for highway signs, and another, which will become standard in all 48 States, is known as "national school bus chrome," and will be used for painting school buses.

A test procedure has been devised for measuring the compressive strength of thin sheet metal. Many sheets are placed together in a pack and are kept from bending by a special apparatus. The results show that the compressive properties of sheet metal are often very different from the tensile properties—an important matter in designing aeroplanes and other light structures.

In the hydraulics laboratory, experiments were made on a model of the Indian Rock dam for the Engineer Corps of the Army. The work showed that certain changes should be made in the stilling basins, and these are being incorporated in the full-sized structure which will protect the city of York, Pa., against floods.

The effects of using new and unfamiliar materials in book papers have been determined with the aid of the Government Printing Office. It is now possible to predict approximately how long present-day papers will last under various storage conditions.

New test methods for leather have been developed in co-operation with the American Leather Chemists Association, and a technique for measuring acidity, which is a good indication of the probable resistance of leather to atmospheric exposure, has been used successfully.

The properties of light alloys have been studied with special reference to the effects of vibration and low temperatures on impact resistance. This work has included the examination of parts of wrecked aeroplanes to aid the Government in determining the causes of these accidents.

Because cooling water in air-conditioning systems is used over and over again and becomes contaminated from the impurities in the air, it often is very corrosive. The destruction of piping in these systems is a serious problem. The bureau has suggested certain treatments of the water which will reduce this attack.

All the information that can be obtained about pure iron is necessary for the preparation of new alloys having definite properties. Several ingots of iron, which contain total impurities not exceeding 1/100 of one per cent, have been cast, and their characteristics are being determined.

The technique of making high-quality optical glass for the Navy was improved so that 8,422lb. of satisfactory glass were obtained from 50 melts, as compared with 8,400lb. from 62 melts in 1938.

Investigation of the toxicity of coloured glazes for chinaware showed that only two of these (a green glaze containing copper and lead, and tangerine—a lead glaze) constitute a possible hazard. Care must be used, however, to prevent the marketing of undesirable glazes.

The bureau has demonstrated that a plastic hydrated lime, having satisfactory keeping qualities, can be produced by autoclave treatment, thus making a large saving possible because of the 8% to 10% increase in yield.

Over 7,000,000bbl. of cement were tested for the Federal Government at the bureau's branch laboratories. The Cement Reference Laboratory, which is maintained jointly by the bureau and the American Society for Testing Materials, started a sixth inspection tour of commercial testing laboratories.

Thirteen new Simplified Practice Recommendations and an equal number of Commercial Standards were printed, and many conferences were held which will lead to additional projects.

A new code for the protection of the heads, eyes and lungs of industrial workers, and one section of the revised National Electrical Safety Code were issued. A new edition of the bureau's publication on building codes was published.

Five hundred public purchasing officers were supplied with information on the use of specifications in buying supplies, and with lists of manufacturers who are willing to certify that their products conform to certain nationally recognized specifications and commercial standards.

The properties of 28 special types of wall, floor and partition constructions, recommended by their sponsors for low-cost house construction, were determined. Rain penetration through masonry walls was measured, and a survey was conducted of the types of roofing materials in use in the eastern section of the United States.

Metals, composition materials, building boards, papers, floor coverings, etc., have been tested and reports issued describing their performance. Typical plumbing systems are being studied to show where economies are possible without sacrificing efficiency and with proper safeguards to health.

An experimental dwelling was constructed in which service tests can be made on heating systems. Among other features, the heights of the ceilings can be varied to determine the influence of this factor on fuel consumption.

Good progress has been made on the new high-voltage laboratory, and it is expected that the building will be finished early in 1940.

The results of the year's work were made available through 288 printed publications and articles. In addition 30 mimeographed letter circulars and notes on matters of current interest were prepared and distributed on request.

(L. J. Br.)

Stanford University (The Leland Stanford Junior University). In the year 1939 construction was begun on a new \$600,000 building to house the extensive collections of the Hoover Library on War, Revolution and Peace. The building is a gift to the university from a number of private donors, including John D. Rockefeller, Jr., and from the American Children's Fund, Inc. At the Stanford Medical school, in San Francisco, the Ruth Lucie Stern Research Laboratory was built at a cost of \$100,000 as a gift from Mrs. Louis Stern, of Palo Alto. A further grant for medical research of \$75,000 over a period of five years was received from the Rockefeller Foundation. The Child Guidance Clinic was established with a gift of \$10,000 a year for three years from the Commonwealth Fund.

The expanding program in basic biological research which has been going on for some years was given support through an additional gift of \$200,000 from the Rockefeller Foundation.

The Klystron was invented and developed by members of the Department of Physics as an important apparatus for generating and detecting ultra high-frequency radiation. It promises to be of value not only in aviation but in many other fields.

In spite of existing limitations on the number of students admitted to the lower division and to certain schools, there was an increase in the total number of students because of additional admissions in the upper division and graduate years. The faculty in 1939 numbered 575; the students 4,345 of whom 1,321 were women and 1,186 were graduates. (R. L. W.)

Stark, Harold Raynsford (1880-), American naval officer, was born at Wilkes-Barre, Pa. on November 12. Graduated from the U.S. Naval academy in 1903, he was commissioned ensign two years later and served on various ships and at various naval stations from 1903 to 1917. During the World War he was on the staff of Admiral William S. Sims, commander of the U.S. Naval forces in European waters. He was chief of staff of the Battle Fleet's destroyer squadrons from 1928 to 1930 and chief of the Naval Bureau of Ordnance from 1934 to 1937. He was promoted to rear admiral Nov. 2, 1934. On March 15, 1939 he was appointed chief of naval operations to succeed Admiral William Daniel Leahy, who on June 6 was appointed governor of Puerto Rico. Stark assumed office on August 1 with the rank of admiral.

Stars: see ASTRONOMY.

Starzynski, Stefan (1893-), Polish politician and mayor of Warsaw from 1937 to 1939. He was educated at the High School of Commerce in Warsaw and joined the Polish Army in 1914, in which he fought till the completion of the war with Russia some seven years later. From 1921 to 1924 he was a member of the Polish delegation to the Polish-Soviet Commission for Repatriation; in the latter year he entered the ministry of finance, later becoming (1926-29) deputy director. He was appointed under-secretary of State for finance in 1929. A close student of municipal government and an expert on utility plants, he was elected mayor of Warsaw in 1937. In 1935 he had visited the United States to study at first hand the administration of New York city's government. When the German forces approached Warsaw in Sept. 1939 he organized civilian defence of the city and worked ceaselessly to inspire the population's resistance and maintain its morale. His refusals to yield the city earned him the sobriquet, "Stefan the Stubborn." His radio broadcasts of appeal for British and French assistance were heard throughout the world. According to German press dispatches, Starzynski committed suicide on September 28, the day after Warsaw's surrender, but later reports indicated he was still alive.

State Legislation: see LAW (CASE).

Steamships: see SHIPBUILDING; SHIPPING, MERCHANT MARINE.

Steel: see IRON AND STEEL.

Steiwer, Frederick (1883-1939), U.S. senator, was born in Jefferson, Ore., on October 13 and was educated at Oregon State Agricultural college and the University of Oregon. He was admitted to the bar in 1908 and continued legal practice until 1926. From 1927 to 1938, when he resigned because of ill health, he was a member of the U.S. Senate. Though a confirmed Republican, he voted for many New Deal measures such as the NRA, AAA and TVA in Roosevelt's first term. He delivered the keynote address at the Republican national convention in 1936 which nominated Alfred M. Landon for the presidency and was in prominence also at that time as a possible candidate for vice-president. Steiwer died at Washington, D.C. on February 3.

Stengel, Alfred (1868-1939), American physician, educator, and author, was born November 3 at Pittsburgh, Pa., and received his medical degree from the University of Pennsylvania in 1889, where for many years he was professor of medicine and vice president. He was the author of a text-book of pathology, numerous articles in medical volumes and periodicals, and was American editor of Nothnagel's *Cyclopedia of Medicine*. He died in Philadelphia April 10.

Sterilization. Sterilization here applies to the prevention of reproduction by eliminating the possibility of the fertilization of the female cell (ovum) by that of the male (spermatozoon). In general, this is accomplished by the introduction of a barrier to the passage of these germ cells from the ovary of the female through the Fallopian tubes to the cavity of the uterus, or of those of the male from the testicle through the vas deferens. The term is not to be confused in this consideration, as being synonymous with contraception or castration. The results are the same but there is a difference in that contraceptive procedures do not sterilize either the male or female, while castration prevents the future formation of any germ cells by the removal of the ovaries or testes, as the case may be.

This procedure is justified by considerations of pre-existing diseases of such a type as to render reproduction a distinct maternal hazard. Again, certain eugenic considerations may be the determining factor against the production of offspring from a certain mating. In these instances of hereditary determinations either of the parents may present the aetiological factors justifying the sterilization of the particular individual and that one alone should be prevented from reproduction.

In the male sterilization is usually accomplished by incising the scrotum, under local anaesthesia, over the course of the vas deferens on each side. This small duct is carefully separated from the surrounding structures and doubly ligated. It is then cut and a small segment removed. The incision is closed and in most instances, healing is rapid and uncomplicated. Instances have been reported where males have had supernumerary ducts leading from the testicle. One such case has come under the author's observation. In this case, an epileptic, pregnancy followed the vasectomy and it was necessary to operate again and to tie off the additional vas.

In the sterilization of the female, a method enthusiastically advocated by some operators is that of cauterization of the openings of the Fallopian tubes into the uterine cavity. By this method the lining or endometrium of the uterus and the tubal openings are destroyed by the actual cautery and the subsequent scar tissue

occludes the tube. It is necessary to recheck these individuals after a few months, with X-ray and other methods, to determine that the tubes are completely sealed.

Special electrodes for introduction into the uterine cavity through the vagina and uterine cervix are required.

In certain cases where surgery is impossible, because of pre-existing disease, either mental or physical, the use of X-ray or radium may be employed. These agents owe their effectiveness to the fact that by their use the germ cells of the ovaries may be destroyed and in this manner reproduction be inhibited.

A number of surgical operations on the uterus and tubes have been proposed for the purpose of sterilization. These vary from a removal of the fundus of the uterus to a simple crushing and ligation of the Fallopian tubes. All have as the basic principle a destruction of the patency of these tubes. Pregnancies have been reported following removal of the tubes, the body of the uterus and after operations of various types upon the tubes. Probably most satisfactory, because of the simplicity of technique and dependability of result, is the Pomeroy-Lull modification of the Madlener operation. In this a loop of the Fallopian tube is crushed at the base and ligated with absorbable material and the loop excised. This technique may be carried out either through an abdominal incision or by the vaginal route.

Experimental research on the value of hormones for purposes of sterilization continue. At the present time no definite accomplishment in the field of practical use of endocrine derivatives for this purpose in the human species has been established.

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(J. R. BL.)

Stevenson, Joseph Ross (1866–1939), U.S. theologian, was born at Ligonier, Pa. on March 1, the son of a Presbyterian minister. He graduated from Washington and Jefferson college in 1886 and from McCormick Theological seminary, Chicago, in 1889, after which he studied for a year at the University of Berlin. Upon his return to the United States he was ordained into the Presbyterian ministry, and from 1890 to 1894 he was a pastor at Sedalia, Mo. During the next eight years he taught ecclesiastical history at McCormick Theological seminary. He was pastor of the Fifth Avenue church in New York city from 1902 to 1909, pastor of the Brown Memorial church in Baltimore from 1909 to 1914, and president of Princeton Theological seminary from 1914 until his retirement in 1936. In 1915 he was moderator of the General Assembly of the Presbyterian Church, U.S.A.; he was also president of the International Medical Missionary society and a chairman of the World Conference of Faith and Order. He died August 13 at New York city.

Stockard, Charles Rupert (1879–1939), U.S. biologist and anatomist, was born in Washington county, Miss., on February 27; he was educated at the Mississippi Agricultural and Mechanical college and at Columbia university, where he received his doctorate in 1906. He was granted his medical degree by the University of Wurzburg in 1922. After completing his studies at Columbia, he joined the faculty of the medical college of Cornell university and was professor of anatomy there from 1911 until his death. Dr. Stockard attracted international attention by his morphological investigations and by his experimental production of monstrosities. He died at New York city on April 7.

Stock Exchanges. During 1939 the New York Stock Exchange made a considerable number of important changes in its rules, and also undertook a series of important studies which might have an important bearing upon the future conduct of the Exchange. The most significant of these actions may be grouped under four main headings, namely, (1) changes in listing requirements, (2) changes with respect to current practice, (3) proposed changes designed for the better protection of the public and (4) special studies of certain fundamentally important subjects.

Changes in Listing Requirements.—On January 12, the Exchange announced a revision of listing fees with respect to the following: reduction of initial fee for stock from \$120 to \$50 per 10,000 shares; a 15-year annual continuing fee of \$75 per 100,000 shares for the first 2,000,000 shares, and \$50 per 100,000 shares in excess of 2,000,000; a substitution of a flat fee of \$250 per issue, in place of the existing fee of \$30 per 10,000 shares in connection with minor changes in listed stock on which the annual continuing fee is being paid; and a reduction from \$120 to \$60 per \$1,000,000 principal amount in the listing fee for short term bonds. The Exchange also announced (May 16) the establishment of "a special division to facilitate negotiations for the listing of additional securities under the revised policy announced on Nov. 22, 1938." Two additional policies were also announced, namely (1) "emphasis upon national interests and quality rather than upon size as a test of listing eligibility," and (2) to delist any stock issue whose outstanding shares available for trading have become reduced to approximately 2,000 shares, or in the case of bonds to \$200,000, par amount. On August 1 the Exchange also adopted a condensed form of listing application for companies, already having listed issues, when applying for the listing of new issues.

Important Changes with Respect to Current Practice.—Effective March 20, the Securities and Exchange Commission amended short-selling rules so as "to permit a short sale at the price of the last sale, provided the previous different price was lower than the last sale," whereas the previous rule forbade short sales to be made at or below the last regular way sale. Bona fide international arbitrage transactions were also exempted from price restrictions upon short-selling.

Rules prohibiting general partners of member firms, doing a margin business with the public, from trading on margin, were announced on January 28, effective July 15. Margin positions assumed prior to that date, however, were not required to be liquidated.

On April 13, the Committee on Public Relations announced its endeavour "to stimulate interest in advertising among member firms; that, in passing judgment upon the appropriateness of advertising, it was pursuing a liberal, realistic policy, and that its broad philosophy permitted all reasonable latitude."

Action was also taken (May 10) to classify registered employees into two general groups—"registered representatives" and "branch office managers"—instead of the previously used ten group classification. The change, it was explained, makes possible a "more intensive control" of member firms' registered employees. It is also important to note that the Exchange applies examination requirements to all classes of registered employees. On July 10 announcement was made that 2,800 securities salesmen and securities traders, employees of member firms of the Exchange, had taken "comprehensive written examination in order to qualify under the recently amended Exchange rules affecting registered employees."

Effective April 1, new rules were adopted whereby the capital requirements of member firms doing a general business with the public were increased by about 25%. Exception was made of

firms subject to supervision by State and Federal banking authorities. Under the new rules aggregate indebtedness of a member firm may not exceed 1,500% of its net capital (said capital to be not less than \$25,000), whereas previously such indebtedness was limited to 2,000% of net capital.

Proposed Changes Designed for the Better Protection of the Public.—On July 14 the president of the New York Stock Exchange appointed a public examining board "to study the broad problem of customer protection." The report of this board (rendered August 31) outlined 14 specific recommendations to enhance the protection afforded to customers by member firms. These related to increased capital requirements, enlarged auditing requirements, separating of underwriting from commission business, segregation of free credit balances, establishment of a reserve fund for the Exchange, service charges, increased Stock Exchange income, fidelity insurance for employees and perhaps for partners, minimum margins for commodity accounts and greater disclosure of financial conditions to member firms' customers. Later (September 13) the board of governors accepted the report, approved its general philosophy, and ordered that appropriate committees be assigned the duty to study the suggestions made and to make recommendations thereon. With respect to two important matters, Exchange action was taken on November 14 and December 2 respectively, namely (1) a ruling that all member firms must make available to customers "on request a statement of financial condition as of a date within four months prior to such request," and that notice of such availability must be sent to customers, and (2) the establishment of panels of 504 business and professional men in Baltimore, Md., Boston, Mass., Chicago, Ill., Los Angeles, Calif., Philadelphia, Pa., Pittsburgh, Pa., Richmond, Va., and San Francisco, Calif., from which arbitrators may be drawn in cases involving members of the public.

Studies by Special Committees of Certain Important Subjects.—Four such studies deserve special mention, namely:

- (1) A study of Federal securities legislation, involving the "desirability of equalizing competitive conditions affecting securities traded in over-the-counter and securities listed on organized exchanges."
- (2) A study in collaboration with the SEC, of the amount of stock voted at stockholders' meetings.
- (3) Report of the Washington conference of National Securities Exchanges, with respect to recommended changes in the Securities Exchange

Act of 1934 and the Securities Act of 1933. The SEC, however, opposed all the recommendations for the time being.

(4) A questionnaire study of the desirability of a membership reduction. The result showed the inexpediency of the suggestion for the present, only 40% of the membership replying to the questionnaire, and 238 opposing all forms of seat reduction.

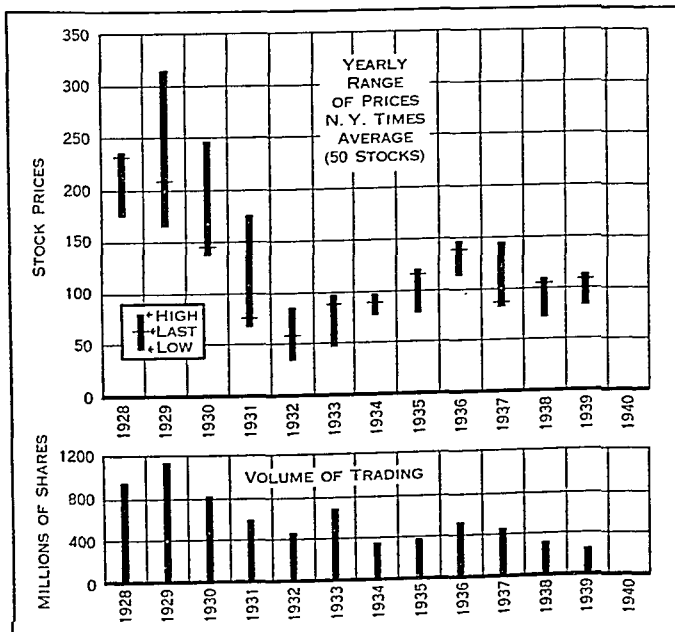
Stocks and Bonds.—The importance of the New York Stock Exchange as a major national market is shown by the huge volume of listings of securities. For stocks on Dec. 1, 1939, such listings aggregated 1,230 separate issues, totalling 1,431,642,000 shares with a market value of \$45,505,229,000. Listed bonds, on the same date, represented 1,396 issues, with a par value of \$52,435,202,000, and a market value of \$47,839,378,000. The number of issuing corporations or governmental units totalled 851 for stock issues and 651 for bonds. Roughly speaking, the New York Stock Exchange serves as the market place for approximately one-fourth of the total wealth of the United States. Of the afore-mentioned totals, foreign stock listings on December 1 aggregated only 40,526,000 shares with a market value of \$905,549,000, while private and public bonds of foreign nations stood at \$4,565,818,000 par value, with a market value of \$2,339,138,000.

Sales of stock on the New York Stock Exchange for 1939 totalled 262,015,799 shares, and for bonds, \$2,048,237,875. For stocks the ratio of stocks to listings amounted to 1.34% for the last month for which data are available. For bonds the ratio of sales to listings for the same month amounted to 2.89%. Volume of stock sales, it will be noticed, was at a rather dull level during 1939, the stock total being 262,015,799 shares as compared with 297,000,000 for 1938, 409,000,000 for 1937, and bond sales \$2,048,237,875 as compared with \$1,859,525,825 for 1938 and \$2,790,323,300 for 1937.

Net borrowings of New York Stock Exchange members on collateral amounted to only 1.26% of the market value of listed shares on Dec. 1, 1939, whereas at the same date for 1938, 1937, 1930, 1929 and 1928, the ratios were respectively 1.35%, 1.69%, 4.06%, 6.32% and 9.66%.

With respect to the New York Curb Exchange, sales during 1939, as reported by *The New York Times*, totalled 45,800,633 shares as compared with 49,795,922 shares during 1938, 104,178,804 shares during 1937, and 134,843,049 shares during 1936. Bond sales totalled \$446,059,000 during 1939 as compared with \$367,937,000 during 1938, \$442,993,000 for 1937 and \$823,050,000 for 1936.

(S. S. H.)



TRADING IN STOCKS on the New York Stock Exchange: yearly range of prices and number of shares sold, exclusive of odd-lot and stopped sales

Stocks. The stock market of the last half of 1938 was a fairly cheerful one, although "the market rise from a percentage viewpoint, following May and June of that year, by no means represented a substantial recovery of the huge decline in dollar value occasioned by the preceding year's bear movement." The rise, however, seemed to have spent its force by the end of the year for all leading groups of stocks. Beginning in Jan. 1939, a gradual decline occurred in all directions, which continued until April when the lows of the year were recorded. Thereafter a material rise ensued for all classes of shares, which continued until the end of September.

From that time onward to the close of the year, the market was relatively stagnant with a slight and gradual decline in the average price.

Using the Babson barometer figures, the average high monthly price of 20 representative railroad stocks stood at 34.33 for Jan. 1939, as compared with 33.98 for Dec. 1938. Thereafter this price declined to a monthly high average of 27.27 for April. Following that month the average kept on improving, with certain minor exceptions, until a monthly high of 35.90 was reached during the month of September.

Security Market Price

	Railroads 20 stocks		Industrials 50 stocks		Public Utilities 20 stocks		Copper and Brass 7 stocks		Stocks 90 stocks	
	1938	1939	1938	1939	1938	1939	1938	1939	1938	1939
Jan.	31.5	31.3	110.5	122.5	59.3	66.6	131.2	145.6	89.3	99.3
Feb.	30.2	30.3	108.5	120.7	55.8	69.7	129.8	134.6	87.6	98.5
March.	25.9	31.1	101.8	120.4	52.6	69.6	124.6	136.9	81.9	98.3
April.	23.0	25.6	97.7	105.2	51.6	62.1	108.5	115.6	78.5	86.0
May.	23.1	26.8	97.5	108.7	56.0	65.5	112.3	114.0	79.2	85.5
June.	22.7	27.2	100.3	110.7	55.9	66.6	103.6	117.9	81.1	86.6
July.	29.6	27.9	120.7	113.2	63.2	68.6	143.3	123.1	97.2	68.6
August.	29.4	27.0	122.4	111.1	59.9	70.2	147.5	125.1	97.7	70.2
Sept.	26.4	32.0	117.6	125.1	55.9	67.1	143.7	152.3	93.7	67.1
Oct.	31.4	35.0	129.3	125.5	65.8	69.0	162.4	154.2	103.7	69.0
Nov.	31.7	33.5	129.1	123.0	66.4	69.5	165.8	140.9	103.8	69.5
Dec.	30.7	..	125.8	..	62.7	..	155.5	..	100.7	..

The above figures are an average for the month based on daily closing prices.

(Source of data—Standard Trade and Securities, Statistical Bulletin—Standard Statistics Company, Inc.)

In the field of industrial stocks, using the Babson average for 30 leading issues, the average high monthly price stood at 154.85 for Jan. 1939, as compared with 154.76 for Dec. 1938. Thereafter a decline occurred which carried this monthly average down to 132.83 for April 1939. The subsequent rise brought the average to a September high of 155.92. In the case of 20 representative mining stocks the average high price for Jan. 1939 was 22.7, compared with a Dec. 1938 average of 28.94. A low average of 19.2 was reached in April 1939, and thereafter the average monthly price improved to 22.5 for September.

The Babson averages are not available at the time of this compilation for the last three months of the year. Yet the aforementioned statement of a slightly declining tendency during the last quarter of the year is confirmed by the composite statement of market values of shares furnished by the New York Stock Exchange. At the close of Sept. 20, 1939 the market value of listed shares on this Exchange stood at \$47,440,477,000. On October 31 the value was approximately the same, namely \$47,373,973,000. On November 30 the recorded value was \$45,505,229,000. December figures are not yet available but it may be stated that very little of moment occurred in the market during the last month of the year.

From the foregoing statement it will be noted that 1939 stock market movements have in no sense been sensational. The decline from January to April with respect to each of the leading groups of stocks, was just about counterbalanced by the rise from May to September. The absence of any sensational movement is probably attributable to the fact that conditions affecting business have not changed materially. The burdens of taxation upon corporations, an unbalanced national budget, a burdensome and rapidly growing indebtedness, and a governmental tendency to fight "big business" and to compete with private industry, continued as unsettling forces during 1939, just as was the case during 1938.

As regards new factors of importance, only one seems apparent, namely the outbreak of the new European war. During the first months of the year current news, in the form of possible war scares, caused a series of rather violent temporary movements. But when the war finally materialized, the stock market seemed remarkably settled. From all appearances the event was greeted as an accepted fact. A moderate rise occurred, occasionally in certain groups of stocks, like the iron and steel, the motor and aircraft groups, which were most likely to be beneficiaries of war orders. Yet this rise soon spent its force, and the market became relatively stagnant as well as constant in price. How different the 1939 stock market has been when compared with that of 1914-15. At the outbreak of the World War in 1914 all stock exchanges were closed owing to the suddenness of the shock, while during 1915 was experienced a stock market boom of extraordinary proportions. This time, however, the market experienced no shock of worthwhile proportions, nor was it followed by any rise measuring up to the proportions of a boom.

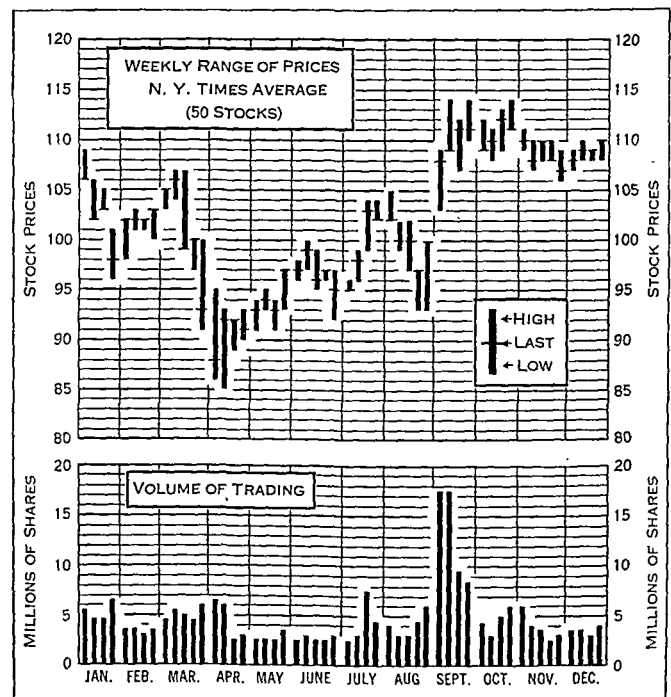
The stock market is generally regarded as a discounter of the future. Evidently, stock-market-wise, war no longer affords the speculative community the glamour that was the case at the close of 1914 and the first half of 1915. Most of the moderate rise which occurred following the outbreak of European hostilities was confined to industrials likely to profit from war orders. Thus Bethlehem Steel and United

States Steel common stocks experienced violent daily movements of as much as 17 and 9 points respectively.

Yet the gain in war stocks of this kind soon wore off, and subsequently was largely lost. The two stocks referred to reached a high of \$100 and \$82 respectively, whereas at the close of the year the quotations had declined to \$82 and \$66 respectively. Evidently the stock market this time is focussing its discounting function upon the domestic situation rather than upon international war.

Number, Volume and Amount of Stocks.—According to the New York Stock Exchange's compilation, the total of stocks listed on that Exchange on Dec. 1, 1939, stood at 1,431,642,000 shares, with a market value of \$45,505,229,000. This value compares with \$46,081,000,000 and \$40,759,000,000 at the corresponding dates of 1938 and 1937. Of this year's total, United States stocks aggregate 1,391,116,000 shares, valued at \$44,599,680,000, and foreign stocks 40,526,000 shares, valued at \$905,549,000. The total of shares was distributed over 1,210 separate American issues, and 20 foreign issues, representing a total of 851 issuing corporations.

Total shares traded on the New York Stock Exchange during 1939 amounted to 262,015,799, as compared with 297,446,059 shares in 1938; 409,468,000 in 1937; 496,063,000 shares in 1936;



TRADING IN STOCKS on the New York Stock Exchange in 1939: weekly range of prices and number of shares sold (exclusive of odd-lot and stopped sales)

and 1,124,991,000 in 1929, the largest total on record. From the standpoint of activity in sales, the 1939 market may be described as relatively dull. Rarely did daily sales exceed the 2,000,000 share market. The New York Curb Market had sales during 1939 of 45,800,633 shares. For other security exchanges of the country data were not available at the time of this compilation. But the other exchanges of the country are relatively unimportant, as regards volume of transactions, in comparison with the New York Stock and the New York Curb Exchanges. (See also STOCK EXCHANGES: *Stocks and Bonds*.) (S. S. H.)

Stone. The form in which it is produced leads to two main classifications for stone: dimension stone and crushed or broken stone. Dimension stone is used in building construction, monuments and memorials, curbing, flagstones and paving stones.

Crushed and broken stone are used mainly in concrete aggregate, road metal, railroad ballast, and riprap, besides a number of other uses dependent on the specific character of the various kinds of stone, especially with limestone and sandstone. In general, only a little over 1% of the total stone output is dimension stone, although it represents probably one-sixth of the value.

The main varieties used include basalt, granite, limestone, marble and sandstone; among the minor varieties are mica schist, argillite, volcanic rocks, boulders and serpentine. Discussion of granite and marble, and of slate will be found under the corresponding headings.

Basalt.—Trap rock, or basalt, production in the United States in 1938 was only 21,850 short tons as dimension stone, but 13,886,000 tons as crushed stone, 87% of which was used as road metal or concrete aggregate, and 4% as railroad ballast. British production of basalt is not reported separately, but is included with other igneous rocks under MARBLE AND GRANITE.

Limestone.—The production of limestone as dimension stone in the United States in 1938 declined 1%, to 704,000 short tons, valued at \$4,936,700, while crushed and broken stone decreased by 13% to 80,976,000 tons, valued at \$77,350,000. Of the dimension stone, 98% was for building stone, while 67% of the crushed stone was for concrete aggregate and road metal, 12% for metallurgical flux, 4% for railroad ballast and 5% for agriculture. These figures do not include 26,183,000 tons used in cement and 6,694,000 tons used in lime, which would give a grand total of 114,391,000 tons. Canadian limestone production decreased in 1938 by 18% to 5,533,000 short tons, valued at \$4,098,000.

The production of limestone in Great Britain in 1937 increased by 11% to 18,935,000 long tons, valued at 3s. 11d. per ton; of this total, 38% was for road metal and ballast, 30% for lime and cement, 15% for metallurgical flux and 6% for the chemical industries.

Sandstone.—The production of sandstone as a dimension stone is comparatively small in the United States, the 1938 output being 166,100 short tons, valued at \$1,473,700, a decrease of 28% from 1937; 40% of this was used in paving, curbing and flagging, and the remainder as building stone.

Sales of crushed and broken sandstone were 6,148,000 short tons, valued at \$6,593,000, a rise of 27% over 1937; of the total, 75% was used for concrete aggregate or road metal, 6% as a refractory, 3% as railroad ballast and 10% as riprap. The production of sandstone in Canada decreased 53% in 1938, to 110,170 short tons, valued at \$207,755.

Sandstone production in Great Britain in 1937 increased by 15% to 4,902,000 long tons, valued at 7s. 11d. per ton; of the total, 56% was used as road metal or ballast, 15% as a refractory, 14% as concrete aggregate and 9% as building stone.

(G. A. Ro.)

Stones, Sharpening: see EMERY; SHARPENING STONES.

Straits Settlements

is one of the three main subdivisions of British Malaya, the others being the Federated and Unfederated Malay States (*q.v.*). It includes the two main ports of Malaya, Singapore and Penang. Its subdivisions are as follows: Singapore island; Penang island; Province Wellesley; Malacca; Pangkor; Christmas island; Labuan and the Cocos islands. It is administered by a governor with an advisory council (Governor, Sir Thomas Shenton Whitelegge Thomas). The population, according to an estimate of June 30, 1938, was 1,344,545, divided, according to race, as follows: Chinese, 852,083; Malays, 301,852; Indians, 150,778; Europeans, 15,165; Eurasians, 12,641; others, 12,026. Singapore (*q.v.*) and Penang are the outlets for the rich Malayan hinterland and carry on an important export trade in tin and rubber. Straits dollar, 48.5 American cents, Oct. 1939. (W. H. CH.)

Strategic Mineral Supplies.

The term "strategic" was originally applied during the World War (1914-18) to designate those materials necessary either directly or indirectly for the development of the war program, but of which the United States lacked sufficient supply to meet the demand; since supplies of these materials must be drawn from outside sources, the methods employed in maintaining the supply had to be given due consideration in the general strategy of

	UNITED STATES	GREAT BRITAIN	FRANCE	RUSSIA	GERMANY	ITALY	JAPAN
METALLIC ORES							
IRON		S	S				
ALUMINIUM			S			S	
ZINC						S	
COPPER							
LEAD							
MANGANESE				S			
CHROMIUM							
MERCURY					S		
PLATINUM				S			
TUNGSTEN							
ANTIMONY							
TIN							
NICKEL							
NON-METALLIC ORES							
FLUORSPAR		S			S		
COAL	S	S			S		
SULPHUR	S					S	S
GRAPHITE					S		S
PYRITE						S	
POTASH				S	S		
MAGNESITE					S		
PHOSPHATES	S			S			
PETROLEUM	S			S			
ASBESTOS				S			
MICA							?
IODINE							?
Total rating	55	14	23	74	29	40	40

?	Conditions uncertain
S	Surplus supply
	Supply adequate
	Self-sufficiency ratio over 2/3
	Self-sufficiency ratio between 2/3 and 1/3
	Self-sufficiency ratio less than 1/3
	Supply completely or almost completely lacking

Ratings cover the home country only, and do not include colonial territory.

McGraw-Hill Book Co., from *Strategic Mineral Supplies* by G. A. Roush

SELF-SUFFICIENCY RATINGS for strategic minerals in leading countries

METALLIC ORES	UNITED STATES				GREAT BRITAIN				FRANCE				RUSSIA				GERMANY				ITALY				JAPAN			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
IRON		●				●				●								●				●					●	
ALUMINIUM		●				●				●								●		●						●		●
ZINC	●	●				●				●				●				●								●		●
COPPER	●					●				●				●				●				●				●		●
LEAD		●				●				●				●				●								●		●
MANGANESE			●			●				●				●				●								●		●
CHROMIUM		●				●				●				●				●				●				●		●
MERCURY			●			●				●				●				●		●						●		●
PLATINUM			●			●				●				●				●				●				●		●
TUNGSTEN			●			●				●				●				●				●				●		●
ANTIMONY			●			●				●				●				●				●				●		●
TIN			●			●				●				●				●				●				●		●
NICKEL	●					●				●				●				●				●				●		●
NON-METALS																												
FLUORSPAR		●				●				●				●				●				●				●		●
COAL	●					●				●				●				●				●				●		●
SULPHUR	●					●				●				●				●				●				●		●
GRAPHITE			●			●				●				●				●				●				●		●
PYRITE			●			●				●				●				●				●				●		●
POTASH						●				●				●				●				●				●		●
MAGNESITE			●			●				●				●				●				●				●		●
PHOSPHATES						●				●				●				●				●				●		●
PETROLEUM	●					●				●				●				●				●				●		●
ASBESTOS		●				●				●				●				●				●				●		●
MICA			●			●				●				●				●				●				●		●
IODINE		●				●				●				●				●				●				●		●

● Indicates the status of the mineral within the political boundaries of the home country
 ○ Indicates the status of the mineral as altered by sources under political or commercial control
 ⊙ Indicates an improved condition within the limits of the designation; e.g., an increase in the surplus, an improvement in an inadequate supply, or a change from a supply whose adequacy is questionable to one fully adequate, yet with no material surplus for export
 A=Surplus supply B=Adequate supply C=Inadequate supply D=No appreciable supply

McGraw-Hill Book Co., from *Strategic Mineral Supplies* by G. A. Roush

PRODUCTION ABILITY of the principal consuming countries for strategic minerals

the war, and hence, the materials concerned came to be known as "strategic." Later, especially in the United States, the purely military side of the term was gradually lost, and it is now quite commonly applied to designate any material the domestic supply of which is deficient.

Of these strategic materials, the minerals and metals derived from them are the most important group. When the fever for rearmament took possession of much of the world a few years back, more attention was given to strategic materials than at any time since the World War, and again with the military needs in the ascendancy. The actual existence of war always disturbs mineral production in the countries involved, and distribution to the rest of the world. The war in China had already caused some difficulties, but these were comparatively minor in both character and magnitude. With the outbreak of war in Europe the situation became more critical, not only because this had the potentiality of developing into a second World War, but also because its location and the countries involved were such as to cause a much wider disturbance in the ordinary channels of international trade, extending to countries not participating in the war, and especially to the United States. While the European war has not yet spread to the magnitude of the World War, it has been extended to include the greater portions of Europe and Asia, embracing areas that normally contribute a rather large proportion of the world's mineral supplies. Hence the present concern over the maintenance of adequate supplies, both for munitions purposes among the countries involved in the war, and for ordinary industrial purposes among those not involved.

The first of the accompanying charts presents an evaluation of the self-sufficiency of the seven major powers, that is their ability to produce within the confines of their own home area their current requirements of the more important minerals and metals that fall in the strategic classification in each of the various countries. In addition to the rating for production of the metallic ores, there is also given a rating for smelting capacity, as in most cases this differs materially. In the second chart much the same information is presented in a different form, supplemented by

data on the extent to which the home country may be able to supplement the immediate domestic supply from sources in colonial territory or from those in foreign countries but owned and controlled by domestic capital.

In interpreting the data presented in these charts there are several points that must be kept in mind. First, the data are only approximate, being based on rough averages of the status during the past few years; due to rapid changes from year to year, no attempt has been made to classify the results more closely than into the groupings of surplus, adequate, and deficient, scaling partial deficiency into thirds. Second, the ability of a country to supply its needs under the pressure of war demand may differ greatly from the conditions here indicated from past performance. Third, political or commercial control of sources of supply in colonial or foreign territory does not necessarily mean that these supplies will be available in time of emergency.

Combining the various self-sufficiency ratios in the first chart by weighting each commodity according to its relative importance gives the following factors indicating the relative ability of each country to supply its needs, on a scale of 100 for complete self-sufficiency: United States, 73; Great Britain 30; France, 33; U.S.S.R. (Russia), 76; Germany, 32; Italy, 37; Japan, 36. Again the reader should be warned that these factors apply to past performance, and may be subject to considerable alteration under war conditions; also, that they apply to conditions of self-sufficiency only, and are in no degree a measure of one country's ability to be of assistance to another.

For example, the fact that Russia is shown to have a high self-sufficiency factor does not mean that she can extend material aid to Germany in case of need, for other data indicate the contrary.

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Strategy of the European War. Germany's invasion of Poland Sept. 1, 1939 followed by declarations of war against Germany by Britain and France caused no change in the national policies of these powers. It was simply that the point had been reached where no choice remained for each except to abandon its policy or attempt to continue it by war. These policies not only in so far as they concern the belligerents but also the neutrals constitute the basis for the war strategy of each side.

These policies date from 1935 and 1936, the years in which Germany re-established universal compulsory military service and re-occupied the Rhine, and Italy due to the imposition of Sanctions abandoned the policy in general hers since 1915 of acting in conjunction with France and Britain. The rearmament of Germany made her a desirable friend for Italy in this new orientation because her new policy put her in opposition in the Mediterranean to Britain and France, the two dominant military powers in that sea and along its African and Asiatic littoral. The result was the Rome-Berlin axis.

The Spanish Civil War showed the Germans and Italians to be acting together in the Mediterranean area, not only against British and French interests but also Russian ones. The already large and constantly increasing military strength of Italy and Germany caused France and Britain to make preparations for the defence of their interests in the whole Mediterranean area. At the same time the increasing military strength of Germany in North Europe led the Russians to lose interest in Spain and the Far East. This because the Russian military authorities knew their large but cumbersome and relatively inefficient military machine would be no match for the German one. The consequence was that French forces available for service in France against Germany before the days of the axis had to be left in Tunisia to defend the Libyan

frontier, in Syria to meet possible attack from the Italian forces in the Dodecanese islands and in the Alps along the Franco-Italian frontier. Also the British troops sent from England and India to strengthen the garrison in Egypt and the Sudan against a possible Italian attack from Abyssinia and Libya lessened the number available for service in France against the Germans. Similarly the need of both the French and British to maintain sufficient naval forces in the Mediterranean to prevent Italy cutting their lines of communication should she go to war decreased the number of ships available to escort Allied commerce and hunt down the German commerce raiders on the high seas.

While Italy did not enter the war she reaffirmed her adherence to the Rome-Berlin axis with the result that this strategical situation in the Mediterranean remained unchanged. It is a highly favourable one to Germany. Spain while neutral emphasized her ties with Italy. Therefore she cannot be completely disregarded in considering possible strategical situations in the western Mediterranean, the Bay of Biscay, and the North Atlantic off the Iberian Peninsula and Morocco.

The Rome-Berlin axis, by the military power it put back of the new orientation of Italian policy, made the first serious break in the isolation of Germany resulting from the treaties which put an end to the war of 1914-18. It opened the way to the second, which also greatly bettered Germany's strategical position, the annexation of Austria. First, it gave Germany a common frontier with Italy thus making possible the easy movement of German troops and aeroplanes to reinforce Italian troops in possible operations on the Franco-Italian frontier. Similarly reinforcement could be sent to Italian troops operating from Albania against its neighbours. Also, German air forces could reinforce Italian military forces using Libya as a base against the French in Tunisia or the British in Egypt. Similarly it put Germany in a position to threaten Italy should she break the Rome-Berlin axis. Second, it isolated Switzerland except for her western frontier with France. Third, it gave Germany a common frontier with both Yugoslavia and Hungary making them more amenable to German demands backed by the possible use of her greatly superior land and air forces. Fourth, it put Germany in a position to attack the Czech part of Czechoslovakia from three sides. The first three of these strategic advantages constitute part of Germany's strategical situation today (Jan. 1, 1940).

The next step was the elimination of Czechoslovakia. First, this subtracted from Germany's enemies in Central Europe, the 30 (approximate) infantry divisions of the Czechoslovakian Army and its air force of 500 (approximate) aeroplanes. Second, it removed any chance of either Poland or Russia in alliance with Czechoslovakia using the Bohemian salient as a jump-off position for the invasion of Germany. Third, it gave Germany a jump-off position to invade Poland from the south similar to the one she already had in the north. Fourth, just as the annexation of Austria put Germany in a favourable strategical position to advance along the south side of the Danube so did the taking over of most of Czechoslovakia put her in a favourable position to advance along the north side of the Danube. Fifth, on the strategic industrial front it gave her possession of the Skoda Arms works. Thus from the axis agreement with Italy Oct. 25, 1937, Germany steadily bettered the strategical position available in case of war.

In addition, as the result of developing the most modern method of using aviation, mechanization, and motorization in conjunction with the older type of infantry, artillery, cavalry, and transport, she was ready to strategically surprise any one of her neighbours except France, protected by the Maginot line of fortifications. (See LIGHTNING WAR; TACTICS IN THE EUROPEAN WAR.)

Taking fullest strategic advantage of both her geographical position and this force she invaded Poland Sept. 1, 1939. Great

Britain and France declared war two days later. These declarations put Germany in the same undesirable strategical situation as in 1914, that is, facing war on her western and eastern frontiers at the same time. The situation was aggravated by the possibility that Britain and France would succeed in their efforts to get Russia to join the "Peace Front." These two powers were trying to build up from the Baltic to the eastern Mediterranean.

However, Germany quickly put an end to the strategical menace of a second military and political front. From the first day of the invasion the Polish army and air force found themselves unable to resist the German invasion. As the result of an agreement with Germany, Russian troops crossed the Polish border September 17. Two days later advancing west they met the Germans coming east.

During Germany's quick campaign in Poland the French had advanced through the "no-man's" land between the French Maginot and the German Siegfried line. This movement never intended to be a serious attack was simply a diversion, to draw if possible German troops to the western front and away from the Polish one.

As soon as it was evident that the Germans were not only victorious but probably had not had to use more than 45 of the approximate 75 infantry divisions earmarked for the Polish campaign, the French terminated their diversion.

Thus Germany found herself in an excellent strategic position on land. In the south she was free from danger of attack. In the east she had no military front. She was in possession of the land and resources of the greater part of the Austrian possessions of the former Austro-Hungarian Empire. The valley of the Danube was open to her for purposes of trade. Also she was in an excellent strategic position to force its opening should one or more of the Balkan nations limit or close its trade to her. Except for that part now constituting Lithuania she had acquired practically the same territory of the former Russian Empire as that given her by the Treaty of Brest-Litovsk imposed on a beaten Russia March 3, 1918.

In addition, the Polish campaign had done no damage to her army and air force not quickly made good by the replacements of man power from depots and material from store houses.

Reliable information puts the number of properly armed, equipped, trained, and led divisions which Germany can put in the field at practically double the number France can mobilize. The number Britain has sent to France and that she will have available within a reasonable period of time is approximately one sixth the number of French divisions. This leaves Germany a surplus equal approximately to five-sixths of the French Army. It is for this reason that France adopted the defensive from the beginning of the war and has maintained it.

An attack on the German Siegfried Line (*q.v.*) during the Polish campaign could not possibly have broken through before that campaign was over. It would have cost France enormous casualties. Therefore, she would have used up a large part of her military resources without attaining the military strategical result of diverting German troops from the Polish to the Western Front. Instead she has greatly strengthened the Maginot Line (*q.v.*). This strong line of fortifications needing fewer troops than would be necessary to hold the frontier were it unfortified permits the French to do two things. The first is to form a large mobile reserve ready to go to the help of Switzerland or Holland and Belgium should they be attacked or to counter attack should the Germans decide to attack the Maginot Line and ultimately after tremendous losses break through somewhere. The second is to send back to civil life a number of their reservists mobilized in the first days of the war and thus lessen the disturbance to the normal life of the nation. This strengthens them economically and financially. The British Army and air forces already landed in France, though relatively small in numbers, help the French in both.

The stalemate which has existed on the Western Front can only be gotten around with heavy and perhaps to the attacker fatal loss; and both sides are exploring some way to bring a decision without making any such attack.

Though the British adopted conscription before the war, they had not up to the end of 1939 shown any intention to use this man power to build up the war army necessary to reinforce the French if the Allies intend to take the offensive. Until they do this the troops needed to turn the German northern flank via the Baltic, or southern via the Balkans, will not be available. The Turkish Army and air force are too small and lack sufficient modern armament to furnish this reinforcement.

Russia's unsuccessful invasion of Finland caused both Germany and the Allies to consider operations in the Nordic States each to checkmate the other in any attempt to use this territory for a flank attack. Russia's strategy is apparently based on two desires. The first is the old Tsarist one to reach the sea. The second is to put herself in the strongest position to resist possible future attack in both Europe and Asia by the capitalist powers.

At sea the strategy of the Allies has been to use every means to strangle Germany economically. This while opposing German efforts through raiding surface ships, submarines, mines, and aeroplanes to destroy the sea commerce of the Allies and the warships and aeroplanes protecting them. (See also BLOCKADE; SUBMARINE WARFARE.)

In the air the military chiefs of all belligerents have shown that a policy which saves pilots and aeroplanes for military action is considered more important than losing them in indecisive raids on cities and various activities in the rear. Up to the close of 1939 nothing decisive happened either at sea or in the air above it and the land.

Thus the year closed with no indication of whether the Allied strategy of military defensive and economic offensive or the German one of the use of armed forces to continue a policy initiated in peace will be successful.

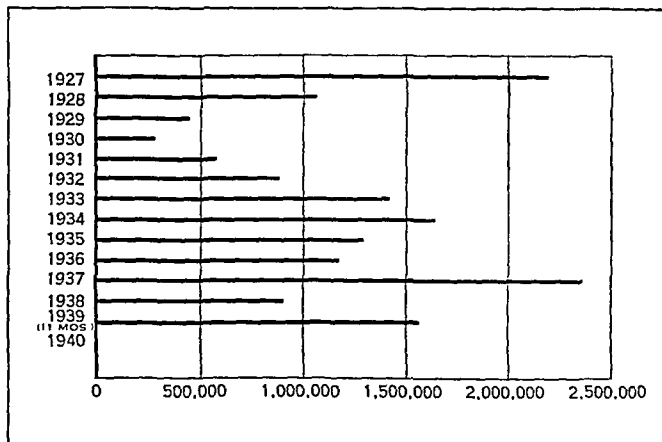
(See also AIR FORCES; ARMIES OF THE WORLD; EUROPEAN WAR; MUNITIONS OF WAR; NAVIES OF THE WORLD.)

(H. J. RE.)

Streamline Trains: see RAILROADS; UNITED STATES.

Strikes and Lock-outs. The United States, Canada and Great Britain publish current

TEAR GAS WAS RELEASED to disperse workers at Cleveland during a strike of automotive tool and die craftsmen in July and Aug. 1939



STRIKES AND LOCK-OUTS in the United States: monthly average of man-days idle

statistics of strikes and lock-outs, their causes and results, together with detailed reports upon the more important strikes of each year. Most of the other nations report them less regularly; some not at all. The Canadian Department of Labour published a report on strikes throughout the world in the *Labour Gazette*, March 1937.

The most recent statistics then available ended in 1935 for most countries.

The present study of labour disputes in 1939 will therefore be confined to the three countries first mentioned.

The political situation in Germany, Italy, Russia and Japan has made it "inadvisable" in recent years for wage earners to undertake strikes.

There have been more strikes in the United States since 1934 than in Great Britain or Canada, both in absolute numbers and in proportion to population. Many of the American strikes have involved a large number of wage earners and been bitterly fought. But the intervention of the Government, both the Federal and some State Governments, has brought many of the strikes to an earlier conclusion.

During the first eight months of 1937, 1938, and 1939, the loss of man-days was 24,147,093, 7,162,720, and 13,765,522 respectively, but during April 1939, 4,876,744 and May 1939, 3,515,751; July 1939, also went above a million days, 1,137,025. It was the heavy man-day losses of these three months that caused the time loss on account of strikes to nearly double in 1939 the corresponding figure for 1938.

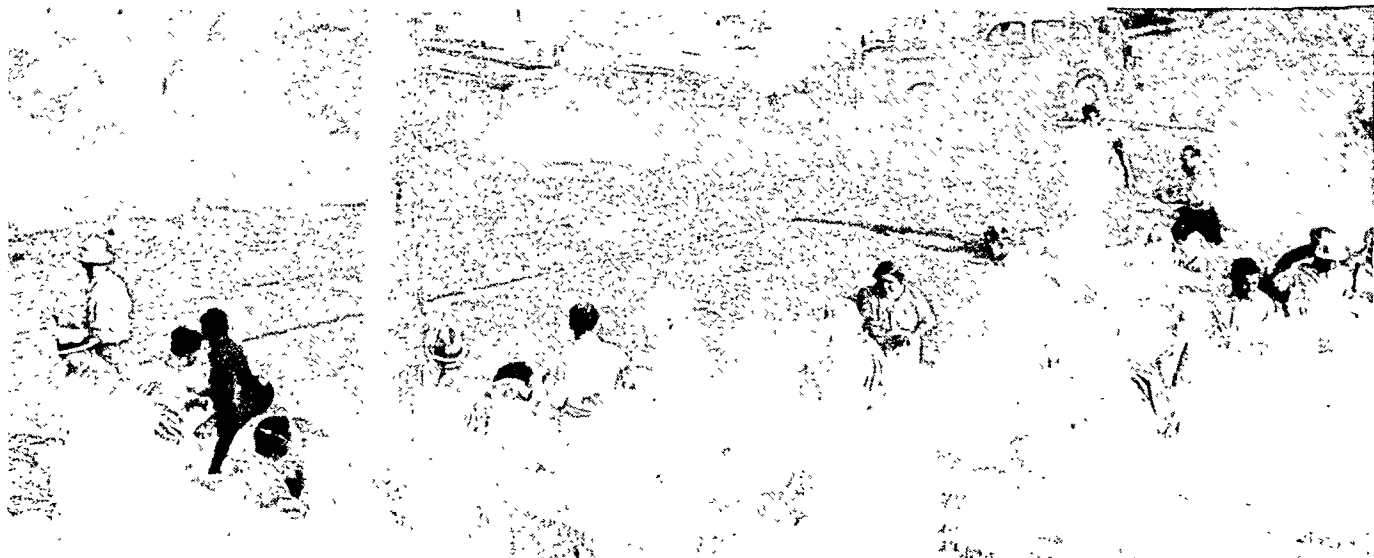


Table I—Number of Strikes, Workers Involved, and Man-Days Lost, 1933–September 1939

Monthly Labor Review, United States Bureau of Labor Statistics, Nov. 1939*

Year and month	Number of strikes					Workers involved in strikes		Man-days idle during month or year
	Continued from preceding month	Beginning in month or year	In progress during month	Ended in month	In effect at end of month	Beginning in month or year	In progress during month	
1933 . . . . .	..	1,695	..	..	..	1,168,272	..	16,872,128
1934 . . . . .	..	1,856	..	..	..	1,466,605	..	19,591,949
1935 . . . . .	..	2,014	..	..	..	1,117,213	..	15,450,337
1936 . . . . .	..	2,172	..	..	..	788,648	..	13,901,956
1937 . . . . .	..	4,740	..	..	..	1,869,621	..	23,424,857
1938 . . . . .	..	2,772	..	..	..	688,376	..	9,148,273
1939								
January	120	178	298	172	126	49,963	71,231	513,150
February	126	179	305	183	122	66,853	86,168	536,010
March	122	196	318	180	138	41,824	62,336	600,527
April	138	226	364	216	148	391,129	419,495	4,876,744
May	148	221	369	231	138	92,603	452,564	3,515,731
June	138	203	341	225	116	57,633	122,340	936,335
July	116	188	304	168	136	170,186	204,757	1,137,025
August*	136	235	371	216	155	65,000	95,000	900,000
September*	155	175	300	200	130	36,000	90,000	750,000

*Strikes involving fewer than 6 workers or lasting less than 1 day are not included in this table nor in the following tables. Notices or leads regarding strikes are obtained by the Bureau from more than 650 daily papers, labour papers, and trade journals, as well as from all Government labour boards. Letters are written to representatives of parties in the disputes asking for detailed and authentic information. Since answers to some of these letters have not yet been received, the figures given for the late months are not final. This is particularly true with regard to figures for the last 2 months, and these should be considered as preliminary estimates.

Table II—Major Issues Involved in Strikes in the United States beginning in January, March and July 1939

Major issue	January		March		July	
	Number	Percent	Number	Percent	Number	Percent
All issues	163	100.0	179	100.0	188	100.0
Wages and Hours	41	25.2	40	22.3	52	27.7
Wage increase	25	15.4	23	12.7	42	22.4
Wage decrease	4	2.5	5	2.8	5	2.7
Wage increase, hour decrease	10	6.1	7	3.9	3	1.6
Wage decrease, hour increase	1	.6	1	.6	1	.5
Hour increase	1	.6	1	.6	1	.5
Hour decrease . . . . .	..	..	3	1.7	..	..
Union organization	91	55.8	107	59.8	98	52.1
Recognition	27	16.4	30	16.8	16	8.5
Recognition and wages	19	11.7	21	11.7	13	6.9
Recognition, wages and hours	21	12.9	15	8.4	21	11.2
Closed or union shop	12	7.4	24	13.4	32	17.0
Discrimination	5	3.1	11	6.1	10	5.3
Other	7	4.3	6	3.4	6	3.2
Miscellaneous	31	19.0	32	17.9	38	20.2
Sympathy . . . . .	..	..	3	1.7	6	3.2
Rival unions or factions	6	3.7	3	1.7	8	4.3
Jurisdiction	4	2.5	7	3.9	9	4.8
Other	21	12.8	19	10.6	15	7.9

Compiled from *The Monthly Labor Review*, U. S. Bureau of Labor Statistics.

Table III—Labour Disputes in Great Britain, January to September 1939 and January to September 1938

Industry Group	January to September 1939			January to September 1938		
	Number of Disputes Beginning in Period	Number of Work People Involved in All Disputes in Progress	Aggregate Duration in Working Days of All Disputes in Progress	Number of Disputes Beginning in Period	Number of Work People Involved in All Disputes in Progress	Aggregate Duration in Working Days of All Disputes in Progress
Fishing and agriculture	7	1,000	43,000	..	..	609,000
Coal mining	266	136,000	385,000	275	141,000	4,000
Other mining and quarrying	9	1,300	45,000	9	700	10,000
Brick, pottery, glass, chemicals, etc.	7	900	8,000	18	2,500	10,000
Engineering	50	27,700	134,000	34	20,000	105,000
Shipbuilding	31	3,900	34,000	24	2,500	28,000
Other metal	62	12,000	72,000	44	8,100	72,000
Textile	54	7,300	102,000	34	5,300	28,000
Clothing	20	4,000	10,000	30	6,100	10,000
Food, drink and tobacco	9	1,000	10,000	15	3,000	28,000
Woodworking, furniture, etc.	17	2,600	23,000	22	1,500	89,000
Building, etc.	102	30,900	119,000	85	13,300	23,000
Transport	25	9,200	45,000	38	7,800	10,000
Commerce, distribution, finance	6	700	1,000	15	1,900	3,000
Others	22	2,200	13,000	26	3,100	3,000
Total	687	240,700	1,064,000	669	212,800	1,122,000

Compiled from *The Ministry of Labour Gazette*.

Table IV—Causes of Labour Disputes in Great Britain, 1939, by Months

Cause	J	F	M	A	M	J	J	A	S
Demands for wage increases	6	6	11	7	12	22	14	23	29
Resistance to wage reductions . . . . .	..	6	4	4	2	2	4	5	5
Other wage questions	18	13	15	16	16	17	20	29	16
Hours	2	..	2	..	..	2	3	..	..
Employment of particular classes of people or individuals	12	23	20	15	21	25	15	15	10
Other working arrangements	15	10	7	7	12	6	8	5	10
Questions involving trade union principles	4	10	2	10	8	6	10	7	2
Sympathetic strikes . . . . .	..	..	3	2	1	1	1	1	..

Compiled from *The Ministry of Labour Gazette*, February–October 1939.

Table V—Results of Labour Disputes in Great Britain Settled in 1939

Results of Strikes	J	F	M	A	M	J	J	A	S
Settled in favour of labour	10	14	11	19	18	23	18	24	13
Settled in favour of employers	24	27	30	21	24	35	24	53	35
Settled by compromises	14	15	19	18	14	22	20	17	9
Negotiations pending, but work resumed	7	5	3	5	9	11	3	3	10

Compiled from *The Ministry of Labour Gazette*, February–October 1939.

Table I shows for the United States the number of strikes, workers involved and days lost, 1933–39. The year 1937 is still the record year in number of strikes since 1917. A period of relative industrial peace 1922–1932 was followed by increased strike activity.

In 1938 there were only 58% as many strikes as in 1937 and but 32% as many man-days lost as in 1937. In 1939 during the first nine months there were fewer strikes than 1938 but twice as many man-days lost. This was due entirely to the shut down of the bituminous coal mines of the Appalachian region in April and May because of conflict over the terms of a new agreement being negotiated.

Though the number of strikes in 1937 exceeded the year 1919 the number of workers involved was far less. It was not until the bituminous strike of 1939 that strikes, when measured in terms of man-days lost, were comparable in severity with those of 1919 when the number of strikers was inflated by the "great strikes" of the period—such as those in the coal mines, steel and textile mills, telephone industry of New England, the general strike at Seattle, the widespread struggles of clothing workers, longshoremen, the printing trades. In 1937 there were definite points of concentration, such as the automobile and maritime industries, but the year was characterized by labour activity "on all fronts," including retail trade, hotels, restaurants and other service industries not affected by strikes in previous years, and a large part of the strikes involved relatively small numbers of people. The years

1938 and 1939 were likewise characterized by the wide distribution of strikes, both industrially and geographically, and there were but a few outstanding disputes, like those in the maritime, automobile and coal industries.

Sit-down strikes almost disappeared as a part of the American strike picture in 1938–39. The firm position taken by the courts on the illegality of such strikes has probably eliminated them as an effective tactic of labour.

The monthly reports on strikes issued by the United States Bureau of Labor Statistics indicate that close to one-

Table VI—*Strikes and Lock-outs in Canada*

Month	1939			1938		
	No. of disputes	No. of employees involved	Time loss in working days	No. of disputes	No. of employees involved	Time loss in working days
January . .	10	1,228	8,047	24	4,293	31,939
February . .	8	2,543	24,971	9	1,627	3,575
March . . .	7	1,628	10,293	14	2,258	9,391
April . . .	6	314	1,361	14	2,871	16,440
May	11	3,424	17,203	15	1,741	12,589
June	11	2,023	8,063	22	2,516	12,672
July	9	4,170	14,060	16	1,428	9,768
August . . .	18	15,031	42,110	22	2,375	12,745
September .	17	8,804	23,652	15	2,132	16,268
October . . .	..	..	..	31	3,146	18,122
November . .	..	..	..	7	392	3,150
December . .	..	..	..	8	274	2,357
Total . . .	97	39,265	151,560	197	25,053	149,025

Compiled from *Canadian Labour Gazette*.Table VII—*Trend of Labour Disputes in Canada, 1931-1938*

Year	Number of disputes	Number of workers involved	Time loss in man-working days
1931	88	10,738	204,238
1932	116	23,390	255,000
1933	125	26,558	317,547
1934	191	45,800	574,519
1935	120	33,209	284,028
1936	156	34,812	276,997
1937	278	71,995	886,303
1938	147	20,395	148,078

Canadian Labour Gazette, March 1939.

half of the strikes of 1939 involved some question of union recognition, with wages the other major issue. This distribution was characteristic of 1937, 1938 and 1939. Tables IV and V show the causes of British disputes and their results. Two contrasts with the United States situation stand out—in Table IV the absence of "union recognition" unless included in "questions involving trade union principles," and in Table V the large percentage of the strikes which ended definitely in favour of the employers.

Canada had only 97 strikes in the first nine months of 1939, involving but 39,265 workers. (See also CALIFORNIA; DETROIT; MICHIGAN; UNITED STATES.) (D. D. L.)

Submarine Warfare.

England declared war on Germany on Sept. 3, 1939. Within nine hours the British liner "Athenia," bound for Canada with 1,400 passengers, was sunk 200 mi. off the Irish coast. Over 100 lives were lost. Had the submarine struck its first blow of the war? Testimony is conflicting but the world had not long to wait for proof that the under sea raider would again be used against merchant shipping. On September 6, four British steamers were sent to the bottom and a fifth was attacked by German submarines.¹

Hardly a day passed during the ensuing months without new victims being added to the toll of the submarine and the mine. In many cases it is impossible to determine whether sinkings resulted from torpedoes or mines. Even when definitely established that a ship sank after striking a mine it is difficult to determine whether or not the loss should be attributed to the submarine. As pointed out in the German official publication, *Nauticus*, the submarine is the ideal mine layer due to its ability to perform the task while submerged, thus denying to the enemy knowledge of the existence or location of mine fields.

Of the 256 merchant ships reported lost in sea warfare in the four months ending Dec. 31, 1939, it is estimated that 38% were sunk by submarines, 35% by mines, and 18% by unknown causes, which in most cases can logically be assumed to be either mines or submarines. Though the submarine has been the greatest single destroyer of ships and lives in the European war, its threat to the Allies has at no time been as great as in 1917. In April of that

year the toll of shipping losses reached 545,200 tons for the British and 881,000 tons for the world. Official British figures released in the last week of 1939 listed the war's toll of merchant ships since September 3 at 248 vessels, totalling 901,344 tons. Of the 248 ships, 126 were British, 11 French, 21 German and 90 neutral. It was estimated that Germany's submarine campaign was destroying daily 7,704 tons of shipping, only one third of the toll in the early part of 1917. German figures simultaneously released gave a total of 242 vessels of which 134 were British, 12 French, 78 neutral and 18 German.

The highest rate of sinkings directly attributable to the submarine occurred during the first three weeks of the present war when 10 ships were reported sunk the first week, 10 the second, and 15 the third. It was on September 17, during the third week, that the submarine dealt its first blow to the British fleet, sinking the aircraft carrier H.M.S. "Courageous" off the south west coast of Ireland with a loss of 515 lives. In the fourth week the submarine toll dropped to six ships and did not exceed this number in 1939 except during the 12th week, when it was eight.

The greatest single submarine victory and one of the most daring accomplishments of all submarine warfare was the sinking of the British battleship H.M.S. "Royal Oak" as it lay at anchor in Scapa Flow, Oct. 14, 1939. The hero of this achievement was Captain-Lieutenant Guenther Prien who was decorated with the Chevalier Cross of the Iron Cross Order by the German Reichsfuehrer. Eight hundred and ten officers and men lost their lives when the "Royal Oak" sank. German U-boats had made unsuccessful attempts to enter Scapa Flow in 1914, during one of which the U-18 was rammed by a patrol boat and scuttled by her crew.

The British Admiralty announced that a feat of almost equal daring was accomplished when the British submarine "Ursula" penetrated the closely guarded mouth of the Elbe river and sank a German cruiser of the "Koeln" class on December 14, 1939 although the cruiser was escorted by six destroyers. Sharing honours in the same announcement was the commanding officer of the British submarine "Salmon" who, in the words of the First Lord of the Admiralty, "rightly abstained from torpedoing the 'Bremen' when that enormous ship was at his mercy." Before encountering the "Bremen," the "Salmon" was reported to have destroyed one of the larger German U-boats, and on December 14, to have fired six torpedoes three of which made hits on two 6,000-ton German cruisers. Germany denied these claims, but if true, the British submarine service avenged the loss of the "Coura-

Warships Sunk by Enemy Action or by Mines, 1939

Name of Ship	Tonnage	Type
BRITISH		
Royal Oak	29,150	Battleship
Courageous	22,500	Aircraft carrier
Rawalpindi	16,697	Armed merchantman
Duchess	1,375	Destroyer
Blanche	1,360	Destroyer
Gipsy	1,335	Destroyer
Oxley	1,354	Submarine
Mastiff	520	Trawler
Aragone	315	Minesweeper
Northern Rover	655	Converted trawler
Loch Doon	534	Converted trawler
James Ludford	500	Converted trawler
Washington	209	Converted trawler
William Hallett	202	Converted trawler
Ray of Hope	200	Converted drifter

Total: 15 ships of 76,906 tons.

GERMAN		
Admiral Graf Spee*	10,000	Pocket battleship
Este	400(?)	Patrol boat
Unidentified ship	400(?)	Patrol boat
20-40 submarines	(?)	Submarines
Total: Unknown.		

FRENCH		
Pluton**	4,773	Minelaying cruiser
Total: 1 ship of 4,773 tons.		

*Scuttled.

**Destroyed by accidental explosion.

In addition to the ships listed, Poland is believed to have lost about 9 ships, and Russia at least 2.

¹ All assertions or opinions contained in the above article are the private ones of the writer and are not to be construed as official or reflecting the views of the U.S. Navy Department or of the naval service at large.

geous" and "Royal Oak" during the same week when the "Exeter," "Ajax," and "Achilles" avenged the "Rawalpindi" in battle with the "Graf Spee" off Montevideo.

German submarine successes against naval vessels of the Allies have not equalled those of the first four months of 1914, when seven British men-of-war, including five cruisers, one seaplane carrier and a gunboat, were destroyed with a loss of over 1,900 lives. The submarine toll in the comparable period of the European war was 2 sunk (1 battleship and 1 aeroplane carrier) with a loss of 1,383 lives, plus damage without loss of 3 additional ships (1 battleship, 1 cruiser and 1 destroyer). A greater number of Allied men-of-war have been at sea and the number of German submarines at the beginning of the European war was 60 as compared to 28 in 1914, but the use of anti-submarine screening vessels has doubtless been largely responsible for the fewer number of naval losses. Other factors are, the improvement of sound detection devices, better depth bombs and depth bombing tactics, the greater number of aeroplanes available for anti-submarine patrol, better British mines, and the fact that at the beginning of the present conflict the submarine was known to be a weapon capable of great destruction, whereas in 1914 it was looked upon with disdain as an infant tied to the apron strings of its mother ship. Then too, the German High Command in 1914 directed its submarine effort primarily against naval objectives, not resorting to unrestricted submarine warfare against commercial vessels until Feb. 1917, whereas the undersea boats were directed against merchant shipping immediately in 1939. Other pertinent considerations are the relative naval and air strengths of the Allies and Germany in the two wars. In the first, Germany had a naval force 36% as great as the Allies compared with 11% in the present conflict. Germany was stronger in the air in both wars, but her air power through greater co-ordination with the submarine effort doubtless has compensated partially for the smaller proportion of naval force.

The effectiveness of the German submarine campaign decreased after the third week of the European war until the middle of November when the magnetic mine was employed. This weapon was probably planted by both submarines and aircraft and, in conjunction with the submarine sinkings, brought new highs in shipping losses in the weeks ending November 26 and December 17. In the latter week at least 30 vessels were sent to the bottom, an all time high for the European war, but still short of the average of 53 ships per week sunk during the unrestricted submarine warfare of 1917. In the latter part of Dec. 1939, the rate of sinkings from all causes dropped to a more normal level, despite the fact that Germany had started concentrated attack on surface ships by aircraft.

Whether or not Germany will be able to increase the rate of destruction of merchant shipping to the point which will threaten England with starvation will depend largely on the rate of destruction of submarines by the Allies and the rate at which Germany can replace her U-boats. In this connection, Mr. Churchill in an address to the House of Commons on Dec. 6, 1939, stated that German submarines were being destroyed at the rate of between two and four per week. This was estimated to be in excess of the rate at which Germany could replace U-boats with completely trained crews. A French estimate near the year's end placed the number of submarines destroyed by the Allies at 40. During the World War of 1914-18, the average number of German undersea craft destroyed during the entire war period was 3.42 per month, and the largest number in any one month was 14, in May 1918. The average for 1918 was 6.4 per month, but during this period Germany had an average of 124 submarines or about twice the number on hand at the beginning of the European war in 1939. In view of the fact that the submarine can sink below the surface without necessarily being destroyed, it is probable that a

number of those reported destroyed are still in operation.

The rate at which Germany can turn out replacement submarines depends largely on the size boat on which she standardizes. During 1914, the average monthly rate of completion of U-boats was 2.2. This increased to 4.3 in 1915, to 9 in 1916, and then decreased to 7.3 for 1917 and 8.5 for 1918. The largest number produced in any one month from 1914 to 1918 was 15 in Dec. 1916. Had the war lasted the German Admiralty planned to reach a rate of one submarine per day by July 1919. The boats actually built during 1914 and 1918 were larger than any of the three German types now in service. These are: oceangoing, 740 tons, 6 torpedo tubes, 4 forward and 2 aft; seagoing, 500 tons, 5 torpedo tubes, 4 forward and 1 aft; and coastal, 250 tons, 3 torpedo tubes. Germany built 24 of this latter type during 1935 and 1936 and conceivably could build them on a mass production basis as reported. The smaller type of submarine not only lends itself more readily to mass production but requires fewer men to operate, the 250 ton boat taking a crew of 23 as compared to 40 for the 740 ton type.

The problem of training replacement crews is not as great as during the war of 1914. The Germans have perfected submarine training devices for use on land. One of these machines provides the means of developing the skill of the commanding officer in making a successful attack on a zigzagging target making changes in speed. Another so accurately simulates the action of a submarine under various conditions of trim and diving plane angles as to provide very good training for the diving officer and crew. Similar devices are used at the submarine training school at New London, Connecticut.

In 1918 the final outcome rested on the decision at sea. It may be so again. In 1917 the submarine very nearly won that decision. It did not fail because of Germany's inability to replace submarines and crews as fast as they were destroyed. The failure was instead due primarily to the great reduction in losses of Allied shipping incident to the success of the convoy system.

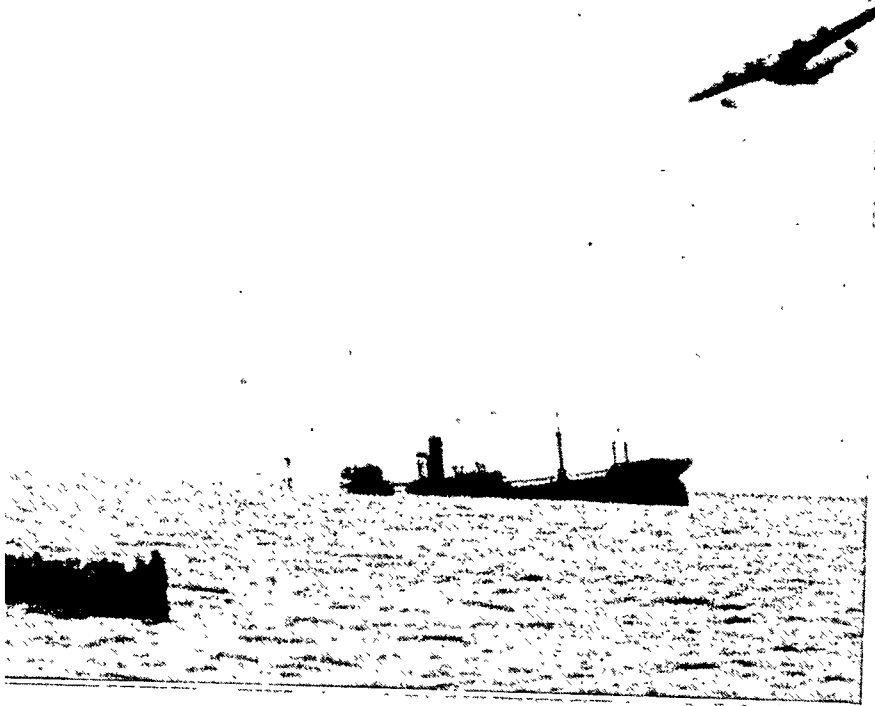
At the beginning of the European war the combined merchant fleets of the Allies aggregated 23,936,000 tons. Thus far the rate at which this tonnage has been destroyed has not reached the proportions of 1917. It remains to be seen whether this rate can be raised to the critical point by Germany's acceleration of submarine replacement and utilization of her air force to assist the submarine in commerce destruction. There must also be considered any additions to her submarine fleet which Germany may obtain from possible allies. Still another factor is the measure of the effect of Germany's understanding with Russia in nullifying the Allied blockade. (See also SHIPPING, MERCHANT MARINE.)

The outcome is not certain but it is clear that the submarine will play a major role. It is a vessel which is cylindrical in cross section at its mid-length and tapers down in diameter toward both ends. It is usually divided into six watertight compartments by transverse bulkheads. The bow compartment is the torpedo room and has the torpedo tubes in its forward part with their axes parallel to the axis of the boat. These tubes have doors at both ends which are capable of manual operation from within the compartment. When the torpedo is to be loaded in the tube the door at the outer end is closed and the inner door opened. The inner door is then closed and the outer door opened when it is desired to fire the torpedo. A shutter or movable section of the bow is also moved clear of the torpedo path by means of gear operated from within the torpedo room. The torpedo is projected from the tube by compressed air suddenly admitted to the after end of the tube and acting on the conically shaped after section of the torpedo.

The second compartment from forward is the forward battery



Above: DROPPING A DEPTH CHARGE from the deck of a British destroyer on submarine patrol out of Portland in Sept. 1939



Left: WHEN THE BRITISH TRAMP STEAMER "Kensington Court" was torpedoed in the first days of the war, 34 of its crew were rescued by two flying boats on patrol

Below, left: THE MOST REMARKABLE SUBMARINE EXPLOIT of 1939 was the sinking of the British battleship "Royal Oak" by a German U-boat which entered Scapa Flow bay early in the morning of October 14

Below, right: FLEET OF GERMAN SUBMARINES at Kiel in 1939



SUBMARINE WARFARE

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Merchant ships sunk in European war, Sept. 3-Dec. 31, 1939

Date of Sinking or Report of Sinking	Ship	Tonnage	Where Sunk	Date of Sinking or Report of Sinking	Ship	Tonnage	Where Sunk	Date of Sinking or Report of Sinking	Ship	Tonnage	Where Sunk
BRITISH				BRITISH (Cont'd)				GERMAN (Cont'd)			
Sept. 3	Athenia	13,581	Off the Hebrides	Nov. 22	Sulby	287	Off coast of Scotland	Sept. 5	Carl Fritzen	6,594	South Atlantic
Sept. 5	Bosnia	2,400	Off Scottish coast	Nov. 23	*Hookwood	926	Off northeast coast of England	Sept. 5	*Johannes		Baltic sea (?)
Sept. 7	Manaar	7,242	Off Lisbon	Nov. 24	*Mangalore	8,886	Off east coast of England	Sept. 6	Inn	5,294	Mid-Atlantic
Sept. 7	Olive Grove	4,060	North Atlantic					Sept. 8	*Heldrid Bismark	2,867	Baltic sea
Sept. 7	Pukkastan	5,809	Southwest of Land's End	Nov. 27	Royston Grange	5,144	Atlantic ocean	Oct. 4	*Unidentified Ship (?)	727	
Sept. 7	Royal Sceptre	4,853	West of Ushant island, France	Nov. 27	William Humphries	276	(?)	Oct. 26	*Gonzenheim	8,000	Near Borkum island
Sept. 8	Regent Tiger	10,716	North sea (?)	Nov. 28	Uskmouth	2,483	Bay of Biscay	Oct. 30	*Halle	4,564	Atlantic ocean
Sept. 8	Winkleigh	5,055	Mid-Atlantic	Nov. 29	*(?) Ionian	3,114	Off east coast of England	Nov. 1	*Emmy Friederich	5,889	(?)
Sept. 9	Kennebec	5,584	(?)	Nov. 29	*Rubislaw	1,041	Off southeast coast of England	Nov. 13	*Mecklenburg	4,327	Caribbean sea
Sept. 10	Goodwood	2,796	(?)	Nov. 30	*Sheaf Crest	2,730	Off southeast coast of England	Nov. 13	*Paraná	7,892	Atlantic ocean
Sept. 10	Magdapur	8,641	Near English coast					Nov. 20	*Bertha Fisser	6,038	Atlantic ocean
Sept. 10	Rio Claro	4,086	(?)	Nov. (?)	*Dryburgh (?)	1,286	Firth of Forth	Nov. 20	*Bertha Fisser	4,110	Off Hoefen, Iceland
Sept. 11	Blairlogie	4,425	Off coast of Northern Ireland	Dec. 1	*Dalryan	4,558	Off southeast coast of England	Nov. 23	*Adolph Woermann	8,577	South Atlantic, off coast of Africa
Sept. 11	Firby	4,869	Off the Hebrides	Dec. 1	*San Calisto	8,010	Off southeast coast of England	Nov. 24	*Tenerife	2,436	Atlantic ocean
Sept. 11	Gartavon	1,777	Near Azores	Dec. 2				Nov. 27	Borkum	3,070	Off English coast (?)
Sept. 12	Inverliffey	9,546	Off Le Havre	Dec. 4	Doric Star	10,086	South Atlantic	Nov. 27	*Unidentified trawler	300	Off Langeland island, Denmark
Sept. 14	British Influence	8,431	Southeast of Land's End	Dec. 4	Tairoa	7,983	Off South Africa	Nov. (?)	*Antiochia	3,106	(?)
Sept. 14	Vancouver City	4,955	Southeast of Coth	Dec. 5	Horsted	1,670	North sea	Dec. 2	*Watussi	9,521	Near Cape Town, South Africa
Sept. 15	Africa Shell	706	Mozambique channel	Dec. 7	(?) Streonshalh	3,895	Off Argentina	Dec. 6	(?) Reinbek	2,804	Baltic sea
Sept. 15	Fanad Head	5,200	North Atlantic	Dec. 8	Brandon	6,668	Off west coast of Britain	Dec. 9	(?)		
Sept. 16	Cheyenne	8,825	Off Southwest coast of Ireland	Dec. 8	(?) Corea	751	Near England (?)	Dec. 9	*Adolph Leonhardt	2,089	Off South Africa
Sept. 16	Devara	291	Scottish fishing grounds	Dec. 8	*Merel	1,088	Off southeast coast of England	Dec. 12	Bolheim	3,324	Gulf of Bothnia
Sept. 16	Truro	974	(?)	Dec. 8	Navasota	8,795	Atlantic ocean	Dec. 19	*Columbus	32,581	450 mi. east of Cape May, N. J.
Sept. 17	Kafiristan	5,193	West of Scilly isles	Dec. 8	Thomas Walton	4,460	Off northern coast of Norway	POLISH			
Sept. 17	Rudyard Kipling	333	Off Northern Ireland	Dec. 9	San Alberto	7,397	Off Land's End	Nov. 26	(?) Pilsudski	14,294	Off northeast coast of England
Sept. 18	Neptunia	798	(?)	Dec. 11	*Willowpool	4,815	North sea	FINNISH			
Sept. 18	*(?) Bramden	1,594	(?)	Dec. 12	*Marwick Head	496	Off east coast of England	Sept. 12	*Olivebank	2,795	Southwest of Esbjerg
Sept. 19	Arlita	326	(?)	Dec. 12	*King Egbert	4,535	North sea	Sept. 23	Martti-Ragnar	2,262	Off Arendal, Norway
Sept. 19	Avimore	4,060	(?)	Dec. 13	Deptford	4,034	Off Bergen	Sept. 23	Walma	1,361	Off Norwegian coast
Sept. 19	Lord Minto	295	(?)	Dec. 15	*Inverlane	9,141	North sea	Oct. 29	(?) Juno	1,241	North sea
Sept. 21	Kensington Court	4,803	Near Irish coast	Dec. 16	*Amble	1,162	Off northeast coast of England	Dec. 1	*Mercator	4,260	Off Scottish coast
Sept. 22	Arkleside (?)	1,567	(?)	Dec. 16	(?) Athel Templar	8,039	North sea	RUSSIAN			
Sept. 22	Akenside	2,694	Off Norwegian coast	Dec. 17	***Serenity	487	Off east coast of England	Sept. 27	Metallist	958	Narva bay, off Estonia
Sept. 24	Hazelside	4,046	Off Cork, Ireland	Dec. 18	(?) City of Kobe	4,375	North sea	NORWEGIAN			
Sept. 27	Caldev	287	(?)	Dec. 18	***Compaganus	270	Off east coast of England	Sept. 13	*Ronda	5,136	Off coast of Netherlands
Sept. 30	Clement	5,051	Off Brazilian coast	Dec. 18	***Isabella Greig	210	Off east coast of England	Sept. 28	(?) Solaas	1,368	North sea
Oct. 4	Belgravian	3,136	Atlantic ocean	Dec. 18	***New Choice	236	Off east coast of England	Sept. 28	Jern	875	Off Kristiansand, Norway
Oct. 5	Newton Beech	4,051	South Atlantic	Dec. 18	***Pearl	678	Off east coast of England	Sept. 29	Takstaas	1,830	Off Marstein, Norway
Oct. 6	Glen Farg	876	(?)	Dec. 19	***Active	185	Off east coast of England	Oct. 4	*Hoegh Transporter	4,914	Singapore harbour
Oct. 6	Ashlea	4,222	South Atlantic	Dec. 19	***Zealous	324	Off east coast of Scotland	Oct. 13	(?) Gressholm	621	Off coast of Netherlands
Oct. 10	Huntsman	8,196	Off coast of Africa	Dec. 20	(?)			Oct. 17	Lorentz W. Hansen	1,918	North Atlantic
Oct. 12	Heronspool	5,202	Off Irish coast	Dec. 20	(?)			Oct. 21	Deodata	3,295	(?)
Oct. 14	Lochavan	9,205	Atlantic ocean	Dec. 20	***River Earn	202	North sea (?)	Oct. 30	Varangmalm	3,618	North sea
Oct. 14	Sneaton	3,677	Atlantic ocean, west of Spain	Dec. 20	***Trinity N. B.	203	Off Egersund, Norway	Nov. 4	*Sig	1,342	North sea
Oct. 17	City of Mandalay	7,028	Atlantic ocean, west of Spain	Dec. 21	(?)			Nov. 13	Arne Kjøde	11,109	Off English coast
Oct. 17	Yorkshire	10,183	Atlantic ocean, west of Spain	Dec. 21	***Zilos	227	North sea (?)	Dec. 1	(?) Realf	8,083	North sea
Oct. 18	(?)			Dec. 21	***River Annan	204	Off Norwegian coast	Dec. 1	*Arcturus	1,277	Off east coast of Scotland
Oct. 20	Trevanion	5,299	South Atlantic	Dec. 25	Stanholme	2,473	Off west coast of England	Dec. 4	(?) Primula	1,024	North sea
Oct. 20	Clan Chisholm	7,256	Northwest of Cap Finisterre	Dec. 29	*Resercho	258	North sea	Dec. 4	*Gimle	1,271	Off east coast of Scotland
Oct. 23	Sea Venture	2,327	Off north coast of Scotland	Dec. (?)	Moortoft	875	(?)	Dec. 7	(?) Britta	6,214	Off west coast of Britain
Oct. 23	Whitemantle	1,692	North sea	Dec. (?)	Sedgely	100	(?)	Dec. 15	*Foina	1,674	Off east coast of Scotland
Oct. 24	Bronte	5,317	(?)	Dec. (?)	Evelina	202	(?)	Dec. 15	*Ragni	1,264	Off northeast coast of England
Oct. 24	Ledbury	3,528	West of Gibraltar	Dec. (?)	Stanbrook	1,383	(?)	Dec. 15	*H. C. Flood	1,997	Off northeast coast of England
Oct. 24	Memin Ridge	2,474	West of Gibraltar	FRENCH				Dec. 17	*Strindheim	321	North sea (?)
Oct. 24	Stonegate	5,044	Atlantic ocean, east of Florida	Sept. 25	Phryne	2,660	North sea, off English coast	Dec. 18	(?) Glittre	6,499	(?)
Oct. 24	Tafna	4,413	West of Gibraltar	Oct. 12	W. Emile Miguet	14,115	Off Irish coast	Dec. 18	(?) Glitrefjell	1,568	Off east coast of Scotland
Oct. 24	Malabar	8,465	North Atlantic	Oct. 14	Bretagne	10,108	Atlantic ocean	Dec. 20	(?)		
Oct. 30	Cairnmona	4,666	(?)	Oct. 14	Louisiane	6,933	Atlantic ocean	Dec. 22	Lappen	563	(?)
Oct. 30	Lynx II	250	Off Pentland Firth	Oct. 17	Vermont	5,186	Atlantic ocean	Dec. 27	*Rudolf	924	North sea
Oct. 30	St. Nidan	505	Off Pentland Firth	Nov. 4	Baoule	5,874	Atlantic ocean	Dec. 27	Torwood	254	North sea
Nov. 9	(?) Carmarthen	961	Off English coast	Nov. 16	(?) Rochelais	(?)	Bay of Biscay	SWEDISH			
Nov. 12	*Bordfield	(?)	Off Leith, England	Nov. 20	*Saint-Clair B-922	Less than 100	English channel	Sept. 24	Gertrud Bratt	1,510	Off south Norwegian coast
Nov. 13	(?) Matra	8,003	North sea	Nov. 20	Ruhys	2,921	(?)	Sept. 25	Silesia	1,839	Off Stavanger, Norway
Nov. 13	Ponzano	1,340	Off English coast	Nov. 23	Balyes II	Less than 100	Off coast of France	Sept. 28	Nyland	3,378	Off Kvitsøey, Norway
Nov. 13	*Sirdhana	7,745	Off Singapore	Nov. 27	Simone Michel	171	Near entrance to Somme river	Sept. 30	Gun	1,198	Skagerrak
Nov. 14	Cresswell	275	Off north coast of Scotland	GERMAN							
Nov. 15	*Woodtown	790	Off east coast of England	Sept. 3	Olianda	4,576	South Atlantic				
Nov. 19	*Blackhill	2,492	Off east coast of England	Sept. 4	*Lianna	125	Baltic sea (?)				
Nov. 19	Darino	1,351	Atlantic ocean (?)								
Nov. 20	Arlington Court	4,915	Off Irish coast								
Nov. 20	Pensilva	4,258	Near England (?)								
Nov. 20	*Torchbearer	1,267	Off east coast of England								
Nov. 20	*Wigmore	345	Off east coast of England								
Nov. 21	(?) Delphine	250	Off east coast of England								
Nov. 21	Orsa	1,478	Off northeast coast of England								
Nov. 21	Sea Sweeper	329	North sea								
Nov. 21	Thomas Hankins	276	North sea								
Nov. 22	*Geraldus	2,494	Off east coast of England								
Nov. 22	(?) Lowland	974	North sea								

SUBMARINE WARFARE

Merchant ships sunk in European war, Sept. 3—Dec. 31, 1939 (Continued)

Date of Sinking or Report of Sinking	Ship	Ton- nage	Where Sunk	Date of Sinking or Report of Sinking	Ship	Ton- nage	Where Sunk	Date of Sinking or Report of Sinking	Ship	Ton- nage	Where Sunk
SWEDISH (Cont'd)				GREEK				LITHUANIAN			
Oct. 10	Vistula	1,018	Northeast of Shetland islands (?)	Sept. 4	*Kosti	3,933	Near Falsterbo, Sweden	Nov. 15	*Panevezys	1,607	Off Estonian coast
Oct. 21	Gustaf Adolf	1,400		Sept. 13	Katingo Hajipatera	3,661	(?)	Nov. 15	*Nida	945	Off Estonian coast
Oct. 23	Albania	1,241	Off Great Grimsby, England	Oct. 3	Diamantis	4,900	Off Scilly isles	Nov. 19	*Kaunas	1,521	Off Rotterdam
Nov. 19	*B. O. Borjesson	1,586	Off east coast of England	Oct. 16	Aris	4,810	(?)	ESTONIAN			
Nov. 26	*Gustav E. Reuter	6,336	Off east coast of England (?)	Oct. 20	Konstantinos Hadjipateras	5,962	North sea	Dec. 10	Kassa	About 1,000	Gulf of Finland
Dec. 3	*Rudolf	2,119	Off east coast of England	Nov. 4	*(?) Nicolaos M. Embiricos	5,295	English channel	Dec. 19	***Uko	1,050	North sea
Dec. 10	*(?) Vinga	1,974	North sea	Nov. 22	*Elena R.	4,576	Off south coast of England	ITALIAN			
Dec. 12	*Torne	3,792	South of Copenhagen	Dec. 5	*(?) Parallos	3,435	Thames estuary	Nov. 19	*Grazia	5,857	Off east coast of England
Dec. 13	*Algol	918	Off east coast of Denmark	Dec. 11	Garoufalia	4,708	Off Bergen	Dec. 20	*Comitas	3,482	Off coast of Netherlands
Dec. 15	*Ursus	1,499	Off coast of Netherlands	Dec. 16	*Germaine	5,217	Off southeast coast of England	JAPANESE			
Dec. 20	*Mars	1,877	Off northeast coast of England	DANISH				Nov. 21	*Terukuni Maru	11,930	Off east coast of England
Dec. 20	*Adolf Bratt	1,323	Off Westerschelling	Sept. 30	Vendia	1,150	Off Hanstholm, Denmark	YUGOSLAVIAN			
Dec. 20	*(?) Lister	1,366	North sea	Nov. 3	*Canada	11,108	Off Humber coast, England	Nov. 19	*Carica Milica	6,371	Off east coast of England
Dec. 21	*Carl Henckel	1,352	Off Norwegian coast	Dec. 3	*Ove Toft	2,135	North sea	UNIDENTIFIED			
Dec. 21	*Vega	1,294	Off coast of Netherlands	Dec. 8	*(?) Scotia	2,400	North sea	Nov. 20	*Unidentified Ship	(?)	North sea
DUTCH				Dec. 9	*Magnus	1,339	North sea	Nov. 23	*Unidentified Ship	(?)	Off eastern coast of England
Sept. 8	*Willem Van Ewijk	526	North sea	Dec. 16	*(?) Jaegersborg	1,254	North sea	* Sunk by mine. ** Scuttled by own crew. ***Sunk by planes. Figures available on the European war are quite at variance with each other. Those appearing in the article and in the tables are based on the weight of published data and are official only where so indicated.			
Sept. 9	*Mark	1,514	North sea	Dec. 17	*Bogoe	1,214	Off coast of Scotland				
Oct. 8	*(?) Binnendijk	6,873	Off Weymouth, England	Dec. 19	*(?) Jytte	1,877	North sea				
Nov. 16	Slidrecht	5,133	Atlantic ocean	Dec. 28	*Hanne	1,080	Off northeast coast of England				
Nov. 16	*(?) Mapia	9,389	North sea (?)	BELGIAN							
Nov. 18	*Simon Bolivar	8,309	Off Harwich, England	Sept. 15	*(?) Alex van Opstal	5,965	Off Weymouth, England				
Nov. 19	*(?) Tegri	279	(?)	Oct. 11	Suzon	2,239	(?)				
Nov. 19	*(?) Safe	375	(?)	Dec. 10	*Kabinda	5,182	Off southeast coast of England				
Nov. 27	*Spaarndam	8,857	Off Thames estuary	Dec. 15	*(?) Rosa	1,146	Off northeast coast of England				
Nov. 30	Tajandoen	8,159	English channel								
Dec. 10	*Immingham	398	North sea								

room, so called because half of the large battery cells which supply electrical energy to run the motors which propel the ship when submerged are located under the deck, or floor, of this space. The officers' quarters and radio room are normally in this section.

The next compartment aft is the control room where apparatus

*Belligerent and neutral merchant ships sunk in 1939,
classified by manner of sinking*

Sunk by submarines or surface craft	127
Known sunk by mines	72
Believed sunk by mines	32
Known sunk by planes	10
Believed sunk by planes	3
Scuttled by own crews	12
Total	256

Merchant ships sunk in European war, 1939, by registry

BELLIGERENT NATIONS		
Registry	Number	Tonnage
British	126	441,475
French	11	48,038
German	23	130,311
Polish	1	14,294
*Finnish	5	11,919
*Russian	1	668
Total, all belligerents	167	647,005
NON-BELLIGERENT NATIONS		
Norwegian	25	68,779
Swedish	19	37,020
Dutch	11	49,812
Greek	10	46,587
Danish	9	23,557
Belgian	4	14,532
Lithuanian	3	4,073
Estonian	2	2,050
Italian	2	9,339
Japanese	1	11,930
Yugoslavian	1	6,371
Unidentified	2	?
Total, all non-belligerents	89	274,050
Grand total	256	921,055

*Sunk before start of Finnish-Russian war (except one Finnish ship exploded by mine in North sea).

†Ships of less than 100 tons computed at 50 tons.

is located for operating the ship when submerged. Air and water valves are here arranged in manifolds which admit of the transfer of water ballast from one part of the ship to the other or for admitting or expelling water from trimming tanks as required to adjust the buoyancy and trim. Here are also located the control mechanisms for steering the ship, manipulating the diving planes, opening and closing the flood and vent valves used in diving or surfacing the boat, the telegraphs for indicating desired changes of speed, and the periscope with which observations are made while submerged.

Above the control room is the conning tower and on top of that the navigating bridge from which the ship is conned when on the surface.

In the conning tower there is usually a steering control station and a periscope.

The fourth compartment aft is the after battery room similar to the forward except that the ship's galley or kitchen and the crew's living accommodations are located here.

The next compartment aft contains the Diesel engines which propel the ship on the surface and furnish the power for charging the batteries. The engines cannot be run while the boat is sealed for a dive because of the great volume of air which they require.

The aftermost compartment is the motor room in which are located the large motors for submerged propulsion and miscellaneous auxiliary machinery such as pumps and air compressors. In case the submarine is one which has an after torpedo room this equipment is located in the other compartments, the main motors being in the after part of the engine room.

On top of the submarine proper is a non-watertight superstructure which provides a level deck space and at the same time protects the large hull and battery ventilation piping which runs outside of and just above the pressure hull.

The periscopes can be run up and down like an elevator but the upper end must be above the water to see anything.

Submarine speeds on the surface vary for different boats between 12 and 21 knots. Submerged speeds are between 7 and 10 knots. Cruising radii for small boats are as low as 1,000 mi. and for large ones as high as 16,000 miles. All submarines must run while submerged to maintain depth control by the utilization of forces impressed on their diving planes or fins by the reaction of water on their surfaces.

Water pressure increases about .4 of a pound per square inch per foot depth, hence there is a definite limit below which any given submarine cannot go without crushing its hull. This depth varies for different types from about 250 ft. to 350 feet. Provided they do not exceed this depth submarines can lie on the bottom until their contained air becomes too high in carbon dioxide content or too deficient in oxygen. This depends on the size of the boat, number of men, amount of carbon dioxide reducing chemical carried and the number of oxygen flasks available. It is usually at least two days.

The submarine carries one or more guns on deck but its primary weapon is the torpedo. This is a cylindrical self propelling projectile usually about 21 in. in diameter and about 20 ft. long with a rounded nose and a conical shaped tail. The explosive charge of from 400 to 500 lb. is contained in the forward section. Propulsion is either by steam turbines or reciprocating engines which drive two propellers on concentric shafts. Air at high pressure is converted into steam before reaching the driving engines. The torpedo steers itself and controls its depth by means of two pairs of rudders, one vertical and the other horizontal, mounted on vanes at the after end. The mechanism is started by a lever which is forced aft as the torpedo moves out of the tube.

Torpedoes cost about \$3,000 each. They may be fired from under the water or on the surface and explode upon striking their target.

It was not until Sept. 5, 1914 that a submarine, German U-21, sank a warship with a self-propelled torpedo. Not until early 1917 was the submarine used in unrestricted warfare on merchant shipping. Nearly 400 warships and several thousand merchant ships have since been sent to the bottom by submarines with the loss of thousands of lives. There are now in the world over 700 of the undersea warcraft and more are being built now than at any previous time. Ton for ton the submarine has become the most dreaded destroyer which plies the seas. (See also BLOCKADE; INTERNATIONAL LAW; NAVIES OF THE WORLD; TACTICS IN THE EUROPEAN WAR.)

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Subscription Books Bulletin: see AMERICAN LIBRARY ASSOCIATION.

Sudan: see ANGLO-EGYPTIAN SUDAN; FRENCH COLONIAL EMPIRE.

Sudetenland: see CZECHO-SLOVAKIA.

Sugar. A substantial increase in sugar production was general in 1939 despite delay in harvesting the sugar beet crops in belligerent countries because of labour shortage occasioned by the war. In the United States beet sugar production declined slightly and was estimated by the Department of Agriculture as 1,607,000 short tons, for 1939, and cane sugar at 511,000 short tons. Production in 1938 was 1,685,000 short tons of beet sugar and 583,000 short tons of cane sugar. The 1939 and 1938 production of beet sugar in other leading producing countries was estimated by the International Institute of Agriculture as follows; all in short tons:

	1939	1938		1939	1938
Germany. . . .	2,900,000	2,350,000	Rumania	190,000	184,000
U.S.S.R. . . .	2,600,000	2,400,000	Yugoslavia . . .	141,000	95,000
France	1,138,920	921,277	Hungary	140,000	140,337
United Kingdom	605,000	370,348	Spain	122,000*	100,000
Bohemia, Mora-			Turkey	100,000	56,000
via & Slovakia	599,480	579,228	Ireland	69,700	66,679
Italy	515,000	438,400	Japan	56,732	54,789
Poland	470,000	602,000	Latvia	40,000	41,000
Sweden	337,000	322,290	Bulgaria	39,000	23,790
Belgium	300,000	211,838	Lithuania . . .	30,000	22,003
Netherlands . .	259,000	226,040	Finland	17,000	16,826
Denmark	250,000	201,304	Switzerland . .	16,300	15,000

*Licht's estimate

In Canada production of sugar beets in 1939 was estimated at 628,000 tons and 527,000 tons in 1938. In the United States the 1939 crop of sugar beets was 10,691,000 short tons compared to 11,615,000 short tons in 1938. Production of beet sugar in the United States in 1939 and 1938 by States was as follows, in short tons:

	1939	1938		1939	1938
California . . .	436,000	337,000	Nebraska	102,000	135,000
Colorado	262,000	309,000	Utah	100,000	111,000
Michigan	160,000	171,000	Wyoming	84,000	106,000
Montana	138,000	142,000	Ohio	40,000	43,000
Idaho	129,000	143,000	Other States . .	156,000	188,000

Cane sugar production in the United States in 1939 and 1938 and the ten-year (1928-37) average was as follows, by States:

	1939	1938	Average 1928-37
Louisiana	433,000	491,000	250,000
Florida	78,000	92,000	32,000

Molasses produced, including blackstrap, from sugar cane was estimated at 33,891,000 gals. in Louisiana in 1939 and 38,891,000 gals. in 1938. In Florida, 4,784,000 gals. in 1939 and 5,497,000 gals. in 1938. Sugar cane harvested for sugar in Louisiana in 1939 was estimated at 5,805,000 short tons, compared to 6,741,000 short tons in 1938 and a ten-year (1928-37) average of 3,609,000 short tons. In Florida, 736,000 short tons in 1939 and 882,000 in 1938, with a ten-year average of 382,000 short tons. The ten-year average of sugar (beet) production in the United States is 8,486,000 short tons. Production of beet pulp in the United States in 1939, in 1938 and the ten-year (1928-37) average was estimated by the Department of Agriculture as follows, in short tons:

	1939	1938	Average 1928-37
Moist pulp	1,919,000	1,858,000	1,428,000
Molasses pulp . .	158,000	219,000	126,000
Dried pulp	98,000	105,000	82,000

(S. O. R.)

Suicide Statistics. During the period 1935-37, there was an annual average of 14.5 deaths from suicide per 100,000 of total population in the United States; for England and Wales, the corresponding death rate was 12.6. The highest death rates from suicide in recent years were found in Austria, 38.7; Czecho-Slovakia, 27.8; Germany 28.3; Hungary, 31.5; and Switzerland, 26.0. Suicide death rates were lowest in Eire, 3.1; Northern Ireland, 4.4; and in Spain before the civil war, 4.3.

White persons in the United States are much more prone to suicide than are Negroes, the death rates per 100,000 in 1937 being 16.1 and 4.8 respectively. Among white persons, males, with a death rate of 24.5 per 100,000, are much more liable to suicide than females, who had a death rate of 7.5 per 100,000. There is, on the whole, a marked increase in suicide incidence with advancing age.

It has been generally observed that suicide, particularly among males, tends to become more frequent when economic conditions are low, and to decrease in frequency as conditions improve. There is also a seasonal incidence in suicide, with the greatest number occurring in spring and early summer, and the fewest in winter. Suicide is usually more prevalent in urban than in rural communities. In regard to social economic status there is some evidence to indicate that suicide is most frequent in both the highest and lowest classes.

Average Annual Death Rates from Suicide per 100,000 total population in certain countries for specified periods of years

Country	Period	Death Rates per 100,000	Country	Period	Death Rates per 100,000
Austria	1934-36	38.7	Ireland, Northern .	1935-37	4.4
Australia	1935-37	11.3	Italy	1935-37	7.7
Belgium	1934-36	16.9	Japan	1934-36	21.3
Bulgaria	1934-36	9.2	Lithuania	1934-36	8.4
Canada	1935-37	8.5	Netherlands	1935-37	8.0
Czecho-Slovakia	1935-37	27.8	New Zealand	1935-37	10.4
Denmark	1935-37	19.2	Norway	1934-36	6.6
Eire	1935-37	3.1	Portugal	1934-36	12.0
England and Wales	1935-37	12.6	Rumania	1935-37	10.3
Estonia	1934-36	23.8	Scotland	1935-37	9.5
Finland	1935-37	17.8	Spain	1933-35	4.3
France	1933-35	20.5	Sweden	1933-35	16.0
Germany	1934-36	28.3	Switzerland	1935-37	26.0
Hungary	1934-36	31.5	United States	1935-37	14.5

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Sulphanilamide: see ANAESTHESIA; ARTHRITIS; CHEMISTRY; CHEMOTHERAPY; DERMATOLOGY; EAR, NOSE AND THROAT, DISEASES OF; EPIDEMICS AND PUBLIC HEALTH CONTROL; EYE, DISEASES OF; INDUSTRIAL RESEARCH; MEDICINE; PNEUMONIA; SURGERY; UROLOGY.

Sulphapyridine: see ANAESTHESIA; CHEMISTRY, APPLIED; CHEMOTHERAPY; HEART AND HEART DISEASES; MEDICINE; PNEUMONIA; SURGERY; UROLOGY.

Sulphur. The United States is the outstanding sulphur producer of the world, with about three-quarters of the entire output; Italy is a poor second, with one-sixth, and Japan third with one-fifteenth; all other producers are so small as to be negligible so far as the world industry is concerned, although the production may serve to satisfy local needs.

World production reached almost 3,000,000 metric tons in 1929, dropped to 1,625,000 tons in 1932, and recovered to the former level in 1937. Italian production has remained with little change during recent years, while that of Japan has been increasing. United States production rose to a new high record of 2,742,000 long tons in 1937, decreasing to 2,393,400 tons in 1938; shipments declined even more heavily, and stocks of 4,200,000 tons have accumulated at the mines. Exports in 1938 were 588,664 tons, chiefly to Canada, United Kingdom, Australia and Germany.

(G. A. Ro.)

Sumatra, which lies north-west of Java and which, along its north-western coast, is closely adjacent to the Malay peninsula, is after Java the most important and after Borneo the largest of the Sunda islands. Its area is 163,145 sq.mi.; population (1930) 8,238,570. It is almost bisected by the Equator, lying between 5° 4' North and 5° 59' South. It contains a long mountain range called the Bukit Barisan ("array of mountains"), of which Mount Indrapura has an elevation of 13,700ft. and Mount Ophir of 10,483 feet. Sumatra is less advanced and less economically developed than Java, but enjoys the same rights of representation in the Volksraad. The island possesses both agricultural and mineral resources. Native agricultural production is mainly devoted to rice cultivation, although Sumatra is not self-

sufficient in rice and depends to some extent on imports from abroad. Rubber and coffee are the main products of the European plantations. Government coal mines in Sumatra yielded an output of about 830,000 tons in 1928. The output of crude oil in the same year was about 880,000 tons. Limited amounts of gold and silver are also mined. Sumatra at the end of 1937 had 1,233mi. of rail and tramway lines and 15,600mi. of highways.

(W. H. Ch.)

Sun: see ASTRONOMY.

Sunday Schools. The World's Sunday School Association is a federation of 51 national and international bodies interested in Christian religious education through the Sunday school and allied agencies. At Oslo, in 1936, a survey reported 369,510 Sunday schools in 129 countries, with 3,145,895 teachers and 34,139,624 scholars. There are no Sunday schools in Russia and Turkey.

The conference held at Madras in Dec. 1938 under the auspices of the International Missionary Council, to consider the world mission of the church, urged "the continual enrichment of the Sunday school in the teaching program of the church." Significant developments during 1939 were the youth leaders' convention of the National Council of Religious Education of Australia, a national youth congress fostered by the National Council of Evangelical Churches of Mexico, the organization of a Council for Christian Education in Iran, the growth of the "Zoe" Sunday schools in Greece, the inauguration of evangelical radio broadcasting in Brazil, a religious education institute in Burma, the meeting of the Bible Lands Union for Christian Education at Choueir on Mount Lebanon, and the appointment of an educational secretary for the Congo Protestant Council.

A new ruling of the Ministry of Education in China permits religious instruction and worship in private schools, students being free to attend and participate as they choose. The National Committee for Christian Religious Education in China has organized a strong West China section and is vigorously furthering its program, with especial emphasis upon training for lay service.

War conditions have hampered the work of the Sunday schools in Europe, especially where children have been evacuated from cities; and it has practically ceased in Austria, Czecho-Slovakia and Poland. The world Sunday school convention planned to be held in Durban, South Africa in 1940 has been indefinitely postponed. A Pan-American Sunday school convention will be held in Mexico in 1941.

(L. A. We.)

Sunshine: see METEOROLOGY.

Super, Charles William (1842-1939), U.S. educator, was born at Pottsville, Pa. on September 12. After completing his education in America and Germany he became professor of languages at Cincinnati Wesleyan college, then professor of Greek at Ohio university, Athens, Ohio. He was acting president of Ohio university from 1883 to 1884 and president from 1884 to 1901. Among his works are *Between Heathenism and Christianity* (1899), *A Liberal Education* (1907), and *Pan-Prussianism* (1918). He died at Athens, Ohio on October 9.

Superphosphates. The bulk of the phosphate rock output of the world is used in the production of superphosphates for fertilizer manufacture, of which there are three standard grades, containing 16%, 32% and 45% of available phosphoric acid. World production of superphosphates is of the order of 16,000,000 metric tons, as compared with 12,000,000 tons of phosphate rock. The chief producing countries and their

percentages of the total are as follows: United States 25%; Japan 13%; Italy 9%; France 9%; Australia 8%; U.S.S.R. (Russia) 8%; Germany 7%; and Netherlands 3%; totalling 82%. Intermediate producers, ranging from 500,000 tons down to 100,000 tons, include New Zealand, Denmark, Belgium, Spain, Sweden, Poland, South Africa, and Latvia, totalling 16%. The remaining 3% is scattered among 14 minor countries. United States production in 1938 was 3,575,000 short tons, a drop of 19% from 1937, increasing to an estimated 3,800,000 tons in 1939. In 1938 about 55% of the phosphate rock output was used in the production of superphosphates and 34% exported; assuming that a similar proportion of the exports also went into superphosphates, the total so used would be about three-quarters of phosphate rock output.

(G. A. Ro.)

Supreme Court of the United States.

The term has differed in vital aspects from prior terms. The reconstruction of the membership of the court and the disposition of the reconstructed court to re-examine doctrines formerly regarded as entrenched have introduced no small measure of uncertainty into the law.

Two more justices were appointed by the President in 1939, Felix Frankfurter, long a professor of law at Harvard, to succeed the late and widely lamented Benjamin Nathan Cardozo, and William O. Douglas, Chairman of the SEC, and formerly professor of law at Yale to succeed the eminent Louis D. Brandeis, resigned. The loss to the bench of Cardozo and Brandeis is inestimable. Their influence will endure wherever the genius of law is invoked. With the appointment of Frank Murphy (Attorney-General) on Jan. 4, 1940 to succeed the late Pierce Butler, President Roosevelt has selected a majority of the Supreme Court.

Administrative Law.—The most significant aspect of developments in Administrative Law has been the enlargement of the scope of the judicial review, to include "negative" as well as "affirmative" orders of commissions (*Rochester Telephone Corp. v. U.S.*, 307 U.S. 125). It has affirmed a Circuit Court of Appeals ruling that it would review the Federal Power Commission's denial of an application for approval of the transfer of properties of one electric power company to another (*Federal Power Com. v. Pacific Power and Light Co.*, 307 U.S. 156).

Civil Rights.—The Supreme Court gave evidence of carefully scrutinizing the activities of local and Federal governmental agencies in their relationships with the people and of protecting the latter from encroachments upon their civil rights by the former. In four important opinions the court championed the cause of the people against oppression by instrumentalities of the State. In the first of these, the judgment of the highest court of the State of Missouri was reversed, and it was decided that denial of admission to a Negro who desired to attend the law school of the University of Missouri constituted a violation of the 14th Amendment (*Gaines, State of Missouri ex rel. v. Canada*, 305 U.S. 337). In another case it was held to be beyond the power of the Department of Labor for that agency to attempt to deport an alien whose membership in the Communist Party had ceased to be effective before he was apprehended (*Kessler v. Strecker*, 307 U.S. 22). The third case saw an act of the Oklahoma Legislature invalidated because it tended to restrict Negroes in the exercise of their right to vote (*Lane v. Wilson*, 307 U.S. 268). Finally, it was held that the mayor and other officials of Jersey City, N.J., had violated the rights of citizens to freedom of speech and of assembly by enacting and enforcing certain ordinances allegedly intended to preserve the peace (*Hague v. C.I.O.*, 307 U.S. 496). In two other decisions it denounced wire-tapping evidence. In one it resolved the conflict of views growing out of the court's ruling in 1937 that evidence of interstate communications obtained by tapping wires is inadmissible in view of the Communications Act of 1934. The same rule is now applied to intrastate messages. The statute is construed to prohibit the interception of all communications (*Nardone v. U.S.*, 307 U.S. 614). In the other case the court holds that the rule is not applicable solely to messages but extends also to information obtained through the use of intercepted conversations (*Weiss v. U.S.*, 307 U.S. 621).

Constitutional Law.—The court discussed points of constitutional law pertaining to regulation of intoxicating liquors, labour relations, marketing of agricultural commodities, motor carriers, the privilege of engaging in business, public utilities, taxation of incomes, transfer of decedents' property and the use of personal property. The court decided 20 cases on due process of law, 18 on commerce clause, 8 on equal protection of the laws, 4 on full faith and credit clause, 7 on dual sovereignty, 4 on jurisdiction of Federal courts, 3 on contract clause, 3 on delegation of legislative power, 3 on amendment of the Constitution, 2 on 21st Amendment, and one each on privileges and immunities, compensation of judiciary, ex post facto laws, 2nd amendment, 4th amendment, 6th amendment, and 15th amendment.

THE SUPREME COURT IN 1939. In the front row, left to right, are Associate Justices Stone and McReynolds, Chief Justice Hughes, Associate Justices Butler (deceased, November 16) and Roberts; rear row, Associate Justices Frankfurter, Black, Reed, and Douglas

In a case involving the power of States to erect interstate trade barriers to protect or benefit home industries, the court held unconstitutional a Florida statute providing for inspection of imported cement and the payment of an inspection fee of 15¢ a hundred pounds (*Hale v. Bimco Trading, Inc.*, 306 U.S. 375). The purpose of the statute, admittedly to encourage the use of the domestic product, was held an unconstitutional burden on interstate commerce. On the other hand, the court sanctioned the applicability of a "use" tax to the use and storage in a State of equipment purchased in other States by interstate railroad and telephone companies (*Pacific Tel. and Tel. Co. v. Gallagher*, 306 U.S. 182). In other cases involving interstate trade barriers, the court sustained anti-discrimination acts of Missouri (*Joseph S. Finch & Co. v. McKittrick*, 305 U.S. 395) and Michigan (*Indianapolis Brewing Co. Inc. v. Liquor Control Commission of the State of Michigan*, 305 U.S. 391) prohibiting the importation into and the sale in such States of liquor manufactured in other States discriminating against liquor manufactured in Missouri and Michigan. The statutes, frequently described as "retaliation" statutes, were held valid under the 21st Amendment over the objection that such amendment could not be construed to sanction State regulation of the liquor traffic which is designed as "an economic weapon of retaliation."

Labour.—In labour the court rendered some of its most significant decisions. In one which attracted wide public attention, the court set forth its first pronouncement regarding a sit-down strike. It held that an employer had the right to discharge employees who had taken possession of its buildings in the course of a sit-down strike, even though the strike might have been directly caused by an unfair labour practice. The opinion lays down the further rule that strikers who aid sit-down strikers are likewise guilty of unlawful conduct and are in no better position than the sit-down strikers themselves, insofar as the employer's right to discharge them is concerned (*NLRB v. Fansteel Metallurgical Corp.*, 305 U.S. 590). Breach of a contract by the employees justified the employer's refusal to bargain collectively (*NLRB v. Sands Mfg. Co.*, 305 U.S. 586); and where the union gave no indication of desire to negotiate, the employer cannot be charged with refusal to bargain collectively (*NLRB v. Columbia Enameling and Stamping Co., Inc.*, 305 U.S. 583). The jurisdiction of the board was extended to the unfair labour practices of an intrastate utility company (*Consolidated Edison Co. v. NLRB*, 305 U.S. 197); and a garment manufacturer operating on a small scale (*NLRB v. Fainblatt*, 307 U.S. 609).

Taxation.—In an epoch-making decision the Supreme Court overruled the ancient doctrine of inter-governmental tax immunity, and held that a State may tax the salary of an employee of the Home Owners' Loan Corporation. Doubt no longer remains but that the Federal Government can tax the salaries of State employees (*Graves v. O'Keefe, New York ex rel.*, 306 U.S. 466; *State Tax Commissioners of Utah v. Van Cott*, 306 U.S. 511). California's use tax on a utility was upheld as merely an incident of intrastate business and not a tax for the privilege of doing interstate business, which tax would be illegal (*Southern Pacific Co. v. Gallagher*, 306 U.S. 167; *Pacific Telephone and Telegraph Co. v. Gallagher*, 306 U.S. 182). Tax for the use of a State highway (*Dixie Ohio Express Co. v. State Revenue Commission*, 306 U.S. 72) or caravanning (*Clark v. Paul Gray, Inc.*, 306 U.S. 583), i.e. driving or towing cars into State for purposes of sale, was also upheld.

Trade Regulation.—Measures in regulation of trade have been encouraged by further judicial sanction of the widening scope of the commerce clause. In a series of agricultural marketing cases the court gave effect to the "stream" or "current" of commerce theory. It upheld the Tobacco Inspection Act regulating auction sales in tobacco warehouses located in the State of the production of the tobacco, over the contention that the sales constituted intrastate transactions immune from Federal regulation, on the theory that, because much of the tobacco was purchased for interstate transportation, the sales of the tobacco constituted a part of the interstate commerce therein (*Currin v. Wallace*, 306 U.S. 1). The same theory was invoked to sustain, as an exercise of the commerce power, the Agricultural Marketing Agreement Act of 1937 and milk marketing orders issued by the Secretary of Agriculture under the statute. In two decisions (*U.S. v. Rock Royal Cooperative*, 307 U.S. 533; *Hood and Sons v. U.S.*, 307 U.S. 588) the court upheld price fixing in the New York metropolitan area and

the Boston area on the ground that sales of milk by producers to handlers operating in the same State are transactions in interstate commerce where the milk is purchased for delivery in another State, and that, as to milk consumed in the same State as that in which it was produced and sold, the intrastate transaction is subject to Federal regulation to make effective the regulation of the interstate commerce. (See also *TENNESSEE VALLEY AUTHORITY*; *UNITED STATES: Supreme Court.*) (B. WE.)

Surgery. Most valuable among developments in surgery during 1939 has been the use of sulphaniilamide and sulphapyridine for the control of postoperative infections. More recently, as a result of the researches of Barlow, a more potent substance, sulphamethylthiazol, has been developed. This can be taken by the patient without nausea in spite of the increased potency of the drug over sulphapyridine. The destruction of staphylococci by this drug, even when they are in the blood stream, is amazing.

The use of vitamins, particularly vitamins B, K and C as replacement or substitution therapy, both in the preoperative and postoperative management of patients whose vitamin deficiency has been the result of certain gastro-intestinal diseases, has reached a pinnacle.

The tendency of the jaundiced patient to bleed has been definitely shown to depend on a deficiency of prothrombin in the circulating blood, which, in turn, is due to a failure in the absorption of the fat-soluble vitamin K from the intestinal tract. Deficiency in the absorption of this substance will depend partly on exclusion of bile from the intestine and partly on injury to the liver, which interferes with the normal formation of the prothrombin. By administering concentrates of vitamin K and bile salts to jaundiced individuals it is possible to restore the concentration of prothrombin to normal and to prevent or correct the haemorrhagic diathesis.

The existence of vitamin K was first noted in 1935. It is a matter of some interest that the structural formula for two naturally occurring forms of this vitamin is already known and that these substances have been prepared synthetically; K-1 (derived from alfalfa) is 2-methyl-3-phytyl-1,4-naphthoquinone, and K-2 (derived from fish meal) is 2,3-difarnesyl-1,4-naphthoquinone. The vitamin has a quinoid structure and a number of simple naphthoquinone derivatives have been shown to have antihaemorrhagic activity comparable to pure synthetic vitamin K. Among these may be mentioned phthiocol (2-methyl-3-hydroxy-1,4-naphthoquinone) and 2-methyl-1,4-naphthoquinone. The former compound is of some biologic interest since it was first isolated from the pigment of *Mycobacterium tuberculosis*. Since vitamin K is probably formed in considerable quantities in the mammalian intestine by bacterial activity, the isolation of the antihaemorrhagic quinone from a bacillus becomes of considerable physiologic significance. The substance 2-methyl-1,4-naphthoquinone is extremely potent in respect to its antihaemorrhagic properties and will doubtless serve as a unit for the measurement of the activity of vitamin K.

Lund and others have called attention to the value of preoperative and postoperative administration of vitamin C to all patients whose gastric function has been disturbed as the result of abnormal lesions, such as ulcer or carcinoma, especially those whose preoperative diets have been deficient in vitamins.

Of further interest in replacement therapy has been the ability successfully to transplant beneath the skin crystalline substances similar in action to the adrenal cortex. This has been effective in prolonging life in cases of Addison's disease, in which various degrees of suprarenal insufficiency are present.

A recent report stated that the transplantation of ovarian tissue from one woman to another has been used in 45 cases and that excessive ovarian tissue was removed from patients with hypermenorrhoea and transplanted into patients with hypomenorrhoea. This procedure is definitely still in the experimental stage.

Encouraging progress is being made in our knowledge of hor-

mones. Methods are being developed for the assay of the hormonal content of blood and urine. These methods should aid in the diagnosis of certain gynaecologic and testicular conditions, such as chorioepithelioma, arrhenoblastoma and teratoma. Hormones, either natural or synthetic, are now available for the treatment of such conditions as senile vaginitis and kraurosis vulvi and for replacement therapy in cases in which these hormones are lacking either because of disease or following the surgical removal of diseased, but functioning, glandular tissue.

The outstanding advance in the field of plastic surgery during 1939 was the presentation by Padgett and Hood of their ingenious device for cutting large skin grafts. With this apparatus a liquid adhesive is used to cause the skin, from which the graft is to be taken, to adhere to a cylindrical drum. As the drum is rotated an adjustable knife, working parallel to the surface of the drum, cuts a graft of any thickness desired. The securing of grafts of uniform thickness is thus rendered largely mechanical.

Further experience with preserved isocartilage (that is, cartilage removed at necropsy or from a living individual other than the patient) has clearly demonstrated the advantage of such grafts over those of autoplasmic type (grafts taken from the patient himself); it also has demonstrated their limitations. Isocartilage appears to be definitely more resistant to infection than does cartilage freshly removed from the patient's own rib (homocartilage) but an appreciable amount of absorption of isografts occurs, particularly in the presence of infection. Isocartilage should never be used until it has remained in the germicidal preserving solution for a sufficient period of time to insure sterilization, usually about two weeks. Moreover, cultures of the cartilage should be made routinely prior to use. Failure to observe these precautionary measures may result in severe infection and necessitate removal of the graft.

Investigative work of the American Academy of Orthopedic Surgery concerning the treatment of fractures of the neck of the femur by operation and fixation with metal nails or screws has been carefully done and has conclusively proved the advantages of this method over the conservative treatment with casts alone.

A new metal, called Vitallium has been introduced. This may be used for plates, pins, and screws in fracture work. It is composed of chromium, cobalt and molybdenum and contains no iron. This metal has been used for many years in dentistry, and has been found to have the least electrolytic reaction of any of the metals. It is also being used in arthroplasty of the hip, that is, to make a cup to cover the end of the femur which is placed in the remade or new acetabulum. This metal seems to cause no reaction on the part of the tissues and is tolerated better than any other metal that can be used.

An operation has been described for growths situated low in the sigmoid, in the rectosigmoid, or high in the rectum; the principal feature of this operation is radical removal of the growth and the adjacent lymph nodes, with preservation of the anus. Subsequent procedures are designed to re-establish the rectal continuity.

The conservative surgical treatment of large staghorn stones in the kidney is now accomplished satisfactorily and with low operative risk. Previously many of these stones have been allowed to remain in place until obstruction, haemorrhage and renal insufficiency developed, and cure of the patient was then very difficult or impossible.

Total removal of the bladder preceded by bilateral transplantation of the ureters, preferably into the bowel but occasionally into the skin, can now be accomplished for certain cases of extensive and otherwise inoperable carcinoma of the bladder, in which the operation is indicated, with a very reasonable operative risk.

The peritoneoscope has been generally accepted throughout the U.S. in the last two years and now every large medical centre has

at least one man using the instrument. It has a definite field of usefulness; it permits visual inspection of certain intra-abdominal structures through a small opening not more than 1 or 1.5 cm. in diameter. (See also MEDICINE.)

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Surinam (DUTCH GUIANA), a colony of the Netherlands in north-eastern South America; area, 54,291 sq.mi.; language, Dutch; capital, Paramaribo (pop. 52,760), governor, Dr. J. C. Kielstra. The population on Jan. 1, 1939, was 152,589, besides an estimated 17,000 bush Negroes and 3,500 Indians in the jungle. The chief city is Paramaribo. In 1937, 29.2% of the population was British Indian, 20.3% Netherlands Indian, in national-ity. The colony has an appointed governor and an elected council. There are 137km. of railroad, and fairly good roads in the coastal district. External communication is by steamship and bi-weekly air service. On Sept. 4, 1939, a regular air service to Curaçao was inaugurated by the Royal Dutch Airlines. Imports, chiefly manufactured products and foodstuffs, totalled 6,866,542 florins in 1937 (Netherlands, 38%; United States, 22.4%); exports were 7,613,210 florins (United States, 64.2%; Netherlands, 22.5%). Bauxite, to the United States, represented nearly 64% of the export value. Imports in 1938 were 6,861,756 florins, exports 6,609,139 florins. In 1938 bauxite production was 377,213 tons, a nominal decline. Other important export products are: gold (440,231gr. produced in 1938), sugar, coffee, molasses and rice. Government expenditure in 1938 was 6,506,644 florins, with revenue only 3,721,863 florins, necessitating a Netherlands Government subsidy to cover the deficit. The monetary unit is the florin (value: approx. 53½ cents U.S.). Surinam has 132 schools (43 Government), with 21,851 enrolment in 1939, besides 33 Indian and bush Negro schools in the jungle. (L. W. BE.)

Swanson, Claude Augustus (1862-1939), U.S. secretary of the Navy, was born at Swansonville, Va., on March 31. After graduating from high school he taught for a year to secure funds for further study. He attended Virginia Polytechnic Institute, worked again for two years as a grocer's clerk, then finished his undergraduate course at Randolph-Macon college in 1885. The next year he received his degree in law at the University of Virginia, was admitted to the bar, and began practice at Chatham, Virginia. His first venture into national politics was successful when, in 1893, he was elected to the U.S. House of Representatives. From 1906 to 1910 he was governor of Virginia and from 1910 to 1933 U.S. senator from that State. He was appointed chairman of the Senate's naval affairs committee in 1918 and had acquired an expert's knowledge of the U.S. Navy when President Roosevelt appointed him to the cabinet in 1933. When he took office as secretary of the Navy, the United States had only 17 warships building. When he died at Rapidan camp, Va., on July 7, the naval forces had been increased by 197 ships either built or under construction. In his six years as secretary he had directed the largest peace-time expansion of naval forces in American history. Swanson believed sincerely in disarmament—at the 1932 Geneva conference he called the submarine a "sea assassin" and urged its proscription—but once the world began rearming he resolved that the United States should have "the greatest navy afloat."

Swaziland: see BRITISH SOUTH AFRICA.

Sweden, area 173,347 sq.mi.; pop. (est. Dec. 31, 1937) 6,310,214. Chief towns (pop. est. Dec. 31, 1937): Stockholm (570,771), Göteborg (275,753), Malmö (151,247), Norrköping (69,737). Ruler: King Gustav V; language: Swedish; religion: Lutheran Christian.

History.—In the budget presented to the Riksdag on Jan. 11, 1939, 238,500,000 kronor, out of a total of 1,363,500,000 kr., was allocated to defence; on March 28 an extraordinary estimate of 66,550,000 kr. was added; on September 9 a supplementary estimate of 360,000,000 kr. was introduced; on September 30 the Government asked for 1,000,000 kronor to provide paravanes for the protection of steamships against mines; and on October 21 supplementary credits amounting to about £22,300,000 were voted for national defence. In May the period of service for conscripts was raised from 200 to 340 days. At a meeting in Stockholm of the foreign ministers of Sweden, Norway, Denmark and Finland on May 9 it was declared that "The Northern countries, as hitherto, remain outside all groups of powers that may be formed in Europe, and in the event of war will do everything to avoid being involved." In September, after the outbreak of war, a list of export embargoes, including scrap iron, was published; a War Commerce Bill was drafted forbidding individuals to incur obligations towards foreign powers; and, as a result of these measures and of the danger to neutral ships from war action, it was stated that Swedish shipping had been brought almost to a standstill. The sinking by the Germans, on September 28, of the "Nyland," a neutral ship bound for a neutral port, was the subject of a strong protest to the German Government. On October 18-19 King Gustav met the Kings of Norway and Denmark and the President of Finland in Stockholm, and in a broadcast to the nation reiterated the determination of the northern countries to maintain their neutrality. In November representations were made to the British Government against her blockade of exports from Germany. Late in the year, when the Russian attack on Finland developed, Sweden's sympathy for Finland combined with her anxiety concerning her own future led to the opening in Stockholm of a recruiting office for volunteers for the Finnish Army, and many thousands of Swedes offered their services. Partial mobilization was ordered on December 5, and on December 27 General Thoernell, the chief of staff, was appointed commander-in-chief of the armed forces. On December 2 the communist journals *Ny Dag* and *Arbetartidningen* were suppressed. A British trade mission visited Stockholm in April, and on December 27 an Anglo-Swedish trade agreement was announced. (E. A. ASH.)

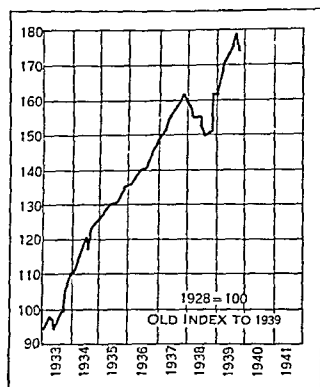
Education 1937.—Elementary, number of scholars 587,000; secondary, number of scholars 59,000.

Defence Forces 1939.—The army consisted of 1,780 officers, 7,282 N.C.O's and men, and an annual contingent of about 14,300 conscripts. Navy and coast artillery, 450 officers, 4,960 N.C.O's and men, and an annual contingent of about 4,900 conscripts; air force, 255 officers, 175 N.C.O's, 1,015 enlisted men, and an annual contingent of 2,370 conscripts.

Banking and Finance.—Revenue, ordinary (est. 1938-39) 1,294,670,000 kronor; expenditure, ordinary (est. 1938-39) 1,294,670,000 kronor; budget estimate, ordinary (1939-40) 1,363,100,000 kronor; public debt (June 30, 1939) 2,633,617,000 kronor; notes in circulation (June 30, 1939) 1,059,000,000 kronor; gold reserve (June 30, 1939) 763,800,000 kronor; exchange rate (Aug. 31, 1939) 17½-18¼ kronor=£1 sterling.

Trade and Communication.—Foreign trade (merchandise): imports (1938): 2,081,910,000 kronor; (Jan.-Aug. 1939) 1,559,100,000 kronor; exports (1938) 1,843,539,000 kronor; (Jan.-Aug. 1939) 1,193,100,000 kronor. Communications and transport: roads, main (Jan. 1, 1939) 52,996mi.; railways, open to traffic (Jan. 1, 1939) 10,486mi.; airways, distance flown (1938) 1,316,-

074mi.; shipping (June 30, 1938) 1,575,700 gross tons; launched (July 1938–June 1939) 175,200 gross tons; motor vehicles licensed (Dec. 31, 1938), cars 219,201; motorcycles 43,551; wireless receiving set licences 1,226,858; telephone subscribers 788,000.



SWEDEN: Industrial production index (The Annalist)

000; gold 7,280 kilograms. Industry and labour. industrial production (1929=100) (average 1938) 146; (average July 1939) 156; employment index (1926–30=100) (average 1938) 117.4; unemployed, trade union returns (average 1938) 74,255; (July 31, 1939) 39,074.

(W. H. WN.)

Sweet Potatoes.

Production of sweet potatoes in the United States in 1939 was estimated at 76,122,000bu., or 1% under the 1938 crop of 76,647,000bu. and 8% above the ten-year average (1928–37) of 70,690,000 bushels. Production by States in 1939 and 1938 was:

	1939 bu.	1938 bu.		1939 bu.	1938 bu.
Georgia . . .	9,840,000	9,225,000	Kentucky . .	1,886,000	2,280,000
Alabama . . .	8,774,000	8,560,000	California . .	1,380,000	1,521,000
North Carolina	8,667,000	8,748,000	Florida . . .	1,240,000	1,400,000
Mississippi . .	7,740,000	7,743,000	Maryland . .	1,200,000	1,040,000
Louisiana . . .	7,592,000	6,030,000	Oklahoma . .	1,100,000	1,470,000
South Carolina	6,909,000	6,468,000	Missouri . . .	1,020,000	1,020,000
Tennessee . . .	4,335,000	5,459,000	Delaware . . .	700,000	500,000
Virginia	4,114,000	3,570,000	Illinois	564,000	648,000
Texas	3,360,000	4,350,000	Indiana	345,000	345,000
Arkansas	2,800,000	3,225,000	Iowa	300,000	300,000
New Jersey . . .	2,025,000	1,470,000	Kansas	240,000	375,000

(See also POTATOES.)

(S. O. R.)

Swimming.

Foremost feats in 1939 were the international record exploits of Richard H. Hough, of the United States, and the Misses Ragnhild Hveger and Inge Sörensen, of Denmark.

Hough bettered three breast stroke standards, at his best clipping the time for 100yd. from 1min. 2.1sec. to 1min. 6/10sec. and 100 metres from 1min. 9.5sec. to 1min. 7.3 seconds. Miss Hveger, now the holder of all but one of 16 free style records listed for women, among others cut the figures for 100yd. from 59.8sec. to 59.7sec. and 500 metres from 6min. 39.1sec. to 6min. 34.3 seconds. Miss Sörensen lowered the breast stroke marks for 400 metres from 6min. 19.2sec. to 6min. 16.2sec. and 500 metres from 8min. 1.9sec. to 7min. 58 seconds. An occurrence of moment was the first defeat suffered by a Hungarian national water polo team since 1928. The Magyars, winners at the last three Olympiads, succumbed to Germany in the tournament for the Horthy Trophy. The score was 2 goals to 1.

A significant feature was the great number of competitive tours undertaken by national teams. In Europe, up to the outbreak of war in September intercountry swimming meets and water polo matches were more frequent than ever, Germany displaying supremacy in the men's field and Denmark in the women's.

The Japanese invaded Manila to triumph in the championships of the Philippines; Australians engaged in a conquering trip

through South Africa; United States squads gained the lion's share of the laurels at carnivals in Argentina, Ecuador, and Cuba; a group of Hawaiians gained their first team victory in the outdoor championships of the United States, outscoring all mainland teams.

(L. DE B. H.)

Swing Music: see DANCE; MUSIC, POPULAR.

Switzerland, area 15,944 sq.mi.; pop. (est. Dec. 31, 1938) 4,194,600. Chief towns (pop. Dec. 31, 1938): Berne (cap. 121,976), Zürich (329,780), Basle (162,559), Geneva (123,286), Lausanne (89,632). Government, Federal Council of seven members; president (Jan. 1, 1940), Dr. M. Pilet-Golaz; languages (census 1930), German 2,924,000; French 831,000; Italian 242,000, other 69,000; religion, Protestant 2,330,000; Roman Catholic 1,666,000.

History.—The results of the general election in October were as follows (previous figures in brackets):—Government Coalition: Radical Democrats 50 (48); Catholic Conservatives 44 (42); Farmers, Traders and Citizens 21 (21); Other Parties: Liberal Democrats 6 (6); Independent Party 9 (7); Young Farmers and Free Democrats 6 (7); Social Democratic Party 45 (50); Dissident Socialists 4 (0); Communists 0 (2); No Party 2 (4). On December 13 Marcel Pilet-Golaz, head of the posts and railway department, was elected president of the Swiss Federation for 1940. He had been president in 1934.

Various measures to strengthen the country's defences were taken during 1939, such as raising the age of liability to military service from 48 to 60 (April 5), lengthening the period of military training (February 2), and the establishment of compulsory service for all civilians (September 5). In March military precautions were taken all along the frontier; on August 29 full mobilization of the frontier forces was decreed, and on the next day Col. Henri Guisan was appointed commander-in-chief of the army, a post which does not exist in peace time. In April, replying to Germany's inquiry concerning President Roosevelt's message, the Government said they knew nothing in advance of that message and that they "place their confidence in the respect of Swiss neutrality, which the Confederation will defend with its army, and which Germany . . . has expressly recognized."

Among the outstanding events of the year were: the arrest on the Grüş Alp on February 14 of two German frontier guards who were pursuing two Austrians into Swiss territory; and the expulsion from the Social Democratic Party on September 16 of M. Léon Nicole, the extreme Leftist leader.

(E. A. ASH.)

Education.—In 1938: elementary 464,714 scholars; secondary 86,190 scholars; university 11,472 students.

Banking and Finance (Confederation).—Revenue, ordinary (1938) 539,005,000 francs; (est. 1939) 511,800,000 francs; expenditure, ordinary (1938) 578,011,000 francs; (est. 1939) 600,700,000 francs; public debt (Jan. 1, 1939, exclg. rlys.) 2,753,315,000 francs; notes in circulation (July 15, 1939) 1,694,987,595 francs; gold reserve (July 15, 1939) 2,466,089,651 francs; exchange rate (average 1938) 21.37 francs=£1 sterling; (Aug. 31, 1939) 18.65–19.45 francs=£1 sterling.

Trade and Communication.—Foreign trade (merchandise); imports (1938) 1,606,903,000 francs; (Jan.–Aug. 1939) 1,167,810,000 francs; exports (1938) 1,316,572,000 francs; (Jan.–Aug. 1939) 998,740,000 francs. Communications and transport: roads suitable for motor traffic (1939) 28,030mi.; railways open to traffic (1939) 3,690mi.; airways (1938): passengers 75,937; goods carried 1,235 metric tons; motor vehicles licensed, 124,195; wireless receiving set licences, 548,533; telephone subscribers, 450,380.

Agriculture and Labour.—Production 1938 (in metric tons): milk 2,860,000; wheat 212,400, (1939) 173,100; potatoes 823,000;



SWISS INFANTRYMAN on mountainside manoeuvre in 1939

beet sugar 93,100; rye 36,800, (1939) 32,700; oats 25,400, (1939) 25,600; cheese 52,600; butter 30,500. Labour: index of employment (1929=100) (average 1938) 77.9; (June 30, 1939) 82.1; unemployed (average 1938): wholly 8.6%; (June 30, 1939): wholly 4.4%; number unemployed (average 1938) 65,583.

(W. H. Wn.)

Symphony Orchestras: see MUSIC.

Synthetic Products: see CHEMISTRY, APPLIED; COTTON; GERMANY; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY; RAYON; RUBBER AND RUBBER MANUFACTURE; TEXTILE INDUSTRY.

Syphilis: see VENEREAL DISEASES.

Syria and Lebanon: see FRENCH COLONIAL EMPIRE; MANDATES.

Table Tennis. European power politics laid a disrupting hand on international table tennis in 1939. Three leading nations in the sport—Austria, Czecho-Slovakia and Poland—have disappeared from the map, while in Hungary, the home of champions, that nation's famous team was broken up and its members scattered to foreign lands. In the 13th world championship tournament, held in March in Cairo, Egypt, under patronage of King Farouk and Queen Farida, Richard Bergmann (Austrian exile in England) won back the men's singles title from Bohumil Vana (Czecho-Slovakia), and Vlascha Depetrisova (Czecho-Slovakia) dethroned Trude Pritzi (Germany) in the women's singles at about the time Miss Pritzi's homeland was moving to dismember Miss Depetrisova's country. Victor Barna (Hungary), and Bergmann won the men's doubles, undefended by Jimmy McClure and Sol Schiff (U.S.A.), the holders. Hilde Bussmann and Miss Pritzi (Germany) won the women's doubles; Vana and Vera Volubcova (Czecho-Slovakia) won the mixed doubles. The Swaythling Cup for men's teams went to Hungary, the Corbillon Cup for women's teams to Germany. In the U.S.A., McClure won the national men's championship and Emily Fuller re-

tained her women's title, at Toledo. New York kept its grip on the national team title and Princeton university won the Bradley Trophy among the college teams. Outbreak of war in Europe caused cancellation by the International Table Tennis Federation of the 14th world championships scheduled for the Stade de Coubertin in Paris in Feb. 1940, and a shifting of table tennis activity to the U.S.A., Australia and New Zealand. There were no changes in the playing rules, but in the U.S.A. there was stricter enforcement of rules against "pushing" (purely defensive tactics).

(C. Z.)

"Tacoma": see NEUTRALITY; URUGUAY.

Tactics in the European War. On land, at sea, and in the air the tactics used successfully in the European war have proved that today, as in the past, Napoleon's dictum, "fire is everything," still holds. In other words, other factors, such as leadership, organization, training, discipline and supply being the same, victory goes to the side which delivers the most damaging fire while most successfully resisting the enemy's fire. The development of high speed in the sky, on the ground and at sea has not changed this.

What has happened in the war to the end of 1939 may be summed up as follows:

1. Where armies fight in the open, those units win victory which make the smallest targets while doing the most damage to the enemy by their own fire.

2. The more an army fortifies itself so that it can successfully resist enemy fire, the more the attacker must develop his own fire to succeed. That is, he must have more cannon, of bigger calibre, firing shells with bigger bursting charges than would be true if he were attacking the same enemy in the open.

3. Ships at sea to survive and win must have the fire power to destroy or drive off enemy surface ships, airships, and submarines. They must have the construction and armour necessary to withstand enemy shells, bombs, and torpedoes.

4. Aeroplanes being unable to carry sufficient armour to survive hits from enemy's fire attempt to escape it by having enough speed to insure they only being within range for a very short time. In other words, they are fleeting targets. The consequence of this speed is that their own target is within the range of their own weapons such a short time, they have only a fleeting opportunity effectively to fire on it. Also their own speed diminishes their accuracy and therefore their chance of hitting the target during the fleeting opportunity given them.

In so far as the infantry, cavalry and artillery are concerned there has been no drastic change in tactics. The infantry has a greater deployment in depth than during the war of 1914-18; it makes a greater use of mortars and howitzers because of their high angle fire. It still survives enemy's fire, because the individual infantry soldier lying down is a small target and scattered by the thousands over a wide area is difficult to hit. Cavalry which has not yet learned to carry the same rifle as the infantry and to use automatic pistols, has but limited use and promptly suffers defeat at the hands of properly armed horsed cavalry and mechanized forces. The artillery is even more important than in the World War (1914-18), because infantry and cavalry are more dependent upon it than was true during that war. Its tactics are based on the principle of quickly furnishing crushing fire against any enemy target which holds up its own infantry or cavalry or which can stop its own tanks and aviation from giving proper support to the infantry and cavalry. The greatest change in tactics results from the great increase in numbers and use of motorcycles, armoured cars, tanks of all kinds and aviation.

In general, where an attempt is made to use any or all of these without adequate support of infantry, horsed cavalry and above all artillery, failure results. This because all are very vulnerable to enemy fire. First, because they are large targets by comparison with infantry or cavalry soldiers. Second, because they must come out in the open and cannot be hidden in the folds of the ground, as is true of batteries of artillery. Third, because they are unarmoured or lightly armoured. Even the most heavily

armoured tanks cannot resist artillery fire.

Prior to the war of 1914-18, the general conviction was that permanent fortifications on land, except perhaps as a pivot for troops in the open, were things of the past. However, the resisting power of field fortifications and of some of the old French permanent forts during the war of 1914-18 led the French to build the Maginot line, a deep zone of steel and concrete. Opposite it the Germans have built the Siegfried line, a deep zone of steel and concrete. In each case, and in particular in the case of the Siegfried line, the tactical principle followed is that of independent units scattered both in width and depth in such a way as to lend each other mutual support by their fire and prevent the capture of any one, or a group from opening a gap through the fortified zone. (See also MAGINOT LINE; SIEGFRIED LINE.)

To make any attack more difficult the rearmost part of the defences are out of range of the heaviest guns which could be brought to bear on the fortifications in front of them. Thus, a complete capture of all fortifications within range of the heavy guns of the attackers would not open a breach from front to rear of the fortified zone. Before the balance could be captured the heavy artillery would have to be moved forward and the whole process repeated. It is probable that at the present time this would have to be done three times before a complete break could be made.

Along with this fire of the heavy artillery would have to go the fire of lighter artillery and the slow advance of infantry, probably by the old slow siege methods. This consists of digging trenches in the front called "saps" from which other trenches parallel to the front called "parallels" are dug, each one farther forward than the last. The last parallel is the jumping off place for the infantry assault. Mining and counter mining would inevitably be necessary.

The other fortified lines in Europe are much less strong and probably could be broken through by the ordinary methods of attack with heavy artillery support.

Up to the end of 1939 aviation had not been used on a large scale to bomb cities, industrial plants, and in general the civilian activities of the rear. The probabilities are that, aside from humanitarian reasons, it is generally considered in military circles that such bombardments cannot have decisive results. On the other hand, the maximum number of aeroplanes is needed for the strategical and tactical support of troops on the ground, where decisive results can be obtained. Undoubtedly another factor is the tremendous improvement in anti-aircraft artillery. It is only when this artillery has been crushed or silenced by the ordinary artillery that aviation can operate with reasonable security against ground targets. (See also AIR FORCES.)

Germany, like Italy, has developed the use of transport planes to carry infantry and machine guns from the rear quickly to points just out of enemy artillery range, where they are disembarked and used to reinforce troops already engaged. The use of parachute infantry and machine guns tried out by the Russians in Finland failed, as was expected by professional military people the world over. In combat in the air, as in the World War of 1914-18, the pursuit plane is still necessary to protect the bombers from attack. At sea, aeroplane attacks by bombing from high altitudes and by diving have been made on warships of various categories, including submarines, and upon merchant ships. Where the planes have not had to meet an accurate anti-aircraft gunfire and where the target has not been sufficiently armoured to withstand these attacks, they have been successful. The tactics of submarines have not changed since the war of 1914-18.

Mine fields of anchored mines are still being used for protective purposes off seacoasts, as barbed wire is used on shore, to keep an enemy at a distance. Mines dropped by aeroplanes have made their appearance. They have proven effective.

In the combat of warship v. warship, there is nothing new. The ship with the heaviest gun power and sufficient armour to withstand enemy shells is victorious. The action of the "Graf Spee" off the Uruguayan coast proved this. With her 11 in. guns, as long as they were in action, she badly battered an 8 in. gun cruiser and kept two 6 in. gun cruisers at a distance. However, her armour was insufficient to resist the fire of the 8 in. enemy guns, with the consequence that her fire control for at least some of her 11 in. guns was destroyed. This lack of armour was due to the fact that her tonnage was limited to 10,000 tons. Therefore, she could not carry 11 in. guns and sufficient armour and have the speed which she possessed. The tonnage limitation prevented this. In other words, like Lord Fisher's battle cruisers of the war of 1914-18, protection through adequate armour having been sacrificed to guns and speed, disaster in battle was the result. (See BLOCKADE; NAVIES OF THE WORLD; SUBMARINE WARFARE.)

The importance of correct tactics coupled with first class armament, training, and leadership, is shown by the difference between Germany's highly successful campaign in Poland and Russia's unsuccessful campaign against Finland. (See also ARMIES OF THE WORLD; EUROPEAN WAR; LIGHTNING WAR.) (H. J. RE.)

Tahiti: see PACIFIC ISLANDS, FRENCH.

Taiwan: see FORMOSA.

Tajik S. S. R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Tanganyika: see BRITISH EAST AFRICA; MANDATES.

Tangier. An international territory, Tangier is one of the zones of Morocco, its legislative power being vested in an international assembly following the Convention of Paris of Dec. 18, 1923. The regime is autonomous, under the nominal sovereignty of the Sultan of Morocco, with France the paramount power. The Sultan's representative is the Mendoub, Sidi Mehemmed Et-Tazi. Area 225 sq.mi.; pop. (est. Dec. 31, 1938) 60,000. Chief town (cap.) Tangier (pop. 45,000). Administrator: M. Le Fur; languages, official: Arabic, French, and Spanish; religion: mainly Mohammedan. Trade, external (1938) imports 94,693,830 francs; exports 11,380,286 francs. Finance: revenue (1938) 26,262,981 fr., (est. 1939) 29,795,500 fr.; expenditure (1938) 27,732,709 fr., (est. 1939) 29,547,359 fr.; public debt (est. 1939) 9,566,548 fr.

In April it was reported that many Italian soldiers, dressed as civilians, had entered the zone, and that some thousands of Spanish Falangists were receiving military instruction from them.

Tanks: see ARMIES OF THE WORLD: *Aeroplanes and Tanks*; LIGHTNING WAR; MUNITIONS OF WAR; TACTICS IN THE EUROPEAN WAR; EUROPEAN WAR.

Tannery, Jean (1878-1939), French financier, born on December 31, began his career as an attaché in the ministry of public works and advanced through various banking positions until he was appointed, in Jan. 1935, governor of the Bank of France. During his régime he secured the co-operation of the United States and Great Britain in establishing stability of international exchange. When Léon Blum formed his Popular Front cabinet, he "promoted" Tannery, in June 1936, to honorary governorship of the bank. Tannery died at Paris on July 7.

Tariffs. Tariffs have relatively lost ground since 1937, and other kinds of restrictions have gained. Japan has progressively tightened her war economy, practically excluding imports for general consumption. Austria had almost eliminated its exchange control, but during 1938 was incorporated in the German system of State control of trade, as were the Sudetenland and

Memel. The rest of Czechoslovakia followed. Albania was swallowed in a customs union with Italy in April 1939, and in September Polish trade came under the German and Soviet state controls. Ecuador re-established a system of import licences; Belgium and Chile have extended their quota systems, and so on. Even without examining the spread of clearing and compensation agreements, tariffs appeared relatively less important on Sept. 1, 1939 than in 1937, though probably up to the outbreak of war between Germany and the United Kingdom, France and Poland, the trade admitted free of duty or subject to no restriction other than tariffs, surtaxes and excises still considerably exceeded that subject to additional methods of control.

The recovery from the depression of 1929-33 had proceeded far enough by 1937 that the commercial policies of most countries were relatively stable. Tariff adjustments since 1937 were unimportant in comparison with the years 1930-1933. There were about the same number of decrees and agreements relating to tariff rates and other control measures, but an increasing proportion of them related to prolongation of quota systems and renewals of short-term agreements of various types, and usually with little or no change. Tariff changes were numerous, but minor adjustments of little significance predominated.

Significant tariff reductions have been, however, embodied in the trade agreements of the United States, notably in those with the United Kingdom and with Canada, effective Jan. 1, 1939. The Canadian agreement revised that of three years earlier, both parties making wider and deeper tariff reductions. The United States also reduced certain rates in agreements with Ecuador, Turkey and Venezuela, effective respectively Oct. 23, 1938, May 5 and Dec. 16, 1939, obtaining reciprocal concessions from those countries. An agreement with Cuba, effective Dec. 23, 1939, was important mainly in restoring United States concessions on Cuban sugar and tobacco, concessions made in 1934 but later suspended in connection with changes in domestic agricultural controls. Negotiations have been announced with Belgium (for revision of the agreement of 1935) and with Argentina, Uruguay and Chile.

Beginning with 1937 commercial policies in Europe have been largely dominated by war and preparation for war. This background meant greater efforts at self-sufficiency and the limitation of non-essential imports both directly and by reducing purchasing power by higher taxes. Some of the most important economic agreements had political and military objectives, such as the three British agreements with Rumania, Sept. 2, 1938, May 11 and July 12, 1939, and such as the German-Soviet agreement of August, and the German-Rumanian agreement of Dec. 1939.

In general, the movement was rather slowly and uncertainly but definitely in the direction of higher tariffs, more State control of trade, and bilateral balancing of trade. The totalitarian states make military self-sufficiency a definite goal. Industrial states seek to stimulate their agriculture, and agricultural states desire to build up manufactures. In some states the movement progresses by deliberate national policy, in others through the political influence of farmers and other groups of producers who obtain governmental support for their interests.

On Dec. 8, 1938 and Sept. 15, 1939 Australia raised many rates of duty at least under the general as distinct from the preferential schedule applicable to imports from British Empire countries. South Africa raised some tariff rates on June 22, 1939. New Zealand's exchange control and licensing system of Dec. 7, 1938 was explained by the prime minister as a permanent policy intended to cushion the country from depressions abroad. The licensing system has been used to prohibit imports, *e.g.* of complete motor cars, and to stop the importation of various non-British products which had in some degree surmounted the very high differentials of the preferential tariff.

An act of Jan. 7, 1939 empowered the Government of the Netherlands to afford "moderate protection" to local industries and many tariff rates were raised effective March 1 and July 10. Belgium increased numerous tariff rates and extended quota restrictions. The Government of India revised the Ottawa agreement with the United Kingdom, abolishing many of the preferential reductions and also reducing the general tariff rates on many articles from 30% or 35% to 25% ad valorem. Minor changes in other countries are too numerous to mention.

War in Europe.—The war which broke out in Europe on September 1 produced for some countries maximum and for others minimum changes in commercial policies. For several years Germany had operated under a strict war economy and large scale military operations required a minimum of change in commercial regulations. An office was established to supervise importation, exportation, and domestic sale of forestry and wood products; and ration cards for meats, fats and oils, milk, sugar, coffee, cereal products and eggs were introduced on August 27. The important fact was the sudden stoppage of trade with England and France rather than any alteration of commercial policy or of the machinery for the state control of trade.

On the other hand, in Britain, France and some neutral countries the outbreak of war produced (or offered an excuse for) maximum change in state control of trade and national economy and deeply affected commercial policy. The tendency was for this war to start where the last one stopped. The British started the World War (1914-18) with the slogan "Business as usual." This war began with widespread application of state control over both foreign and domestic trade. For two years in advance the Food (Defence Plans) Department had been developing its war plans, and controls of leading commodities and industries were rapidly instituted. Within a few days, the war economy was almost as closely organized as in 1918 at the end of four years of war. Enforcement of specific measures began as soon as the war appeared inevitable, although exchange control was not established until September 3. On September 4 the Food Ministry undertook to control imports and stocks of foodstuffs and the prices of some staples, and on September 5 many imports were made subject to licence. The rationing of foodstuffs, however, was postponed until Jan. 8, 1940.

For Britain the war regime has moved drastically in the direction of self-sufficiency and Empire preference. Importation of many products designated as luxuries has been prohibited, although in certain cases licences may be given even for such luxuries as embroidery, gramophones and crystallized fruit. The American tobacco market was disorganized by prompt refusal of foreign exchange for the purchase of tobacco, and from Jan. 1, 1940 all licences for import of tobacco are to be withheld.

The war control has temporarily counteracted a number of the concessions contained in British trade agreements both by substituting prohibitions for tariff reductions and by re-establishing Empire preference in a more effective form. Embargoes have been placed on the exportation of extensive lists of foodstuffs, raw materials and manufactures. Separate control offices have been set up for iron and steel, non-ferrous metals, aluminium, coal, wool, silk and rayon, hemp, flax, jute, leather and hides, paper, timber, molasses and industrial alcohols, dyestuffs, mercury and compounds, machine tools, toluene and cotton. To November 17 the Cotton Control was only collecting data; most of the other controls were regulating exports or imports or both (as well as fixing prices, allotting supplies, etc.).

War control measures began before the war. In Britain the Priority Committee was set up on August 3. On August 24 many metals and some oils were embargoed and the Bank's discount rate was doubled; and in the next two days steps were taken toward

the control of agriculture and the mobilization of foreign securities. In France an embargo was imposed on exportation of war materials on August 15 and on August 28 many raw materials and manufactures were embargoed. War measures, particularly embargoes on exportation of certain foodstuffs and raw materials, were taken by Belgium, Denmark, Norway, Sweden, Egypt and Turkey during the last week of August.

On September 2 the French established a licence system for all imports, and on September 10 a general system of exchange control.

Throughout the British and French Empires, the various dominions and colonies generally followed the lead of the mother countries, though with various delays. Australia, however, instituted exchange control five days ahead of Britain, and New Zealand had established a general licence system and exchange control on Dec. 7, 1938. The measures employed were usually exchange control, licensing of imports, and licensing of exports, but in some places the licences were not required for all products.

The effect of the outbreak of war either on the belligerents or on the neutrals was reflected in only a minor degree in changes of tariff rates. The total number of changes since the first of September is considerable, but not much more than normal. Many of the rates seem to reflect the need of additional revenue, and mineral oils, liquors, tobacco and coffee, already heavily taxed, have had further burdens imposed on them. Italy has prohibited the sale of coffee, and Hungary imposed a permit tax of 200% of the retail price of tea and coffee. Great Britain increased the duty on tobacco by 2s. per pound (in addition to the 2s. of April 1939), the total duty now being equivalent to some 1,500% ad valorem. On the other hand, the belligerents have removed or reduced tariff rates upon some necessities. For example, the United Kingdom has exempted pig iron, aluminium and certain alloys and manufactures of aluminium. France exempted horses and mules and beans and reduced the tax on rubber.

The outbreak of war was the presumable cause of rapid extension of state control over trade in neutral countries. Most widespread was the introduction of embargoes and licensing systems for the restriction of exports. Almost every country in Europe and some others restricted or embargoed the exportation of longer or shorter lists of foodstuffs, raw materials, and even in some cases manufactured articles. Eire, Finland and Egypt introduced exchange control and in some countries exchange controls became more rigid.

In the first weeks of September Peru, Haiti, Nicaragua and Estonia gave their Governments wide powers to control imports and exports and aspects of the domestic economy. In Brazil the National Economic Defence Council is to control imports and exports and regulate the supply of goods for internal consumption. The Federal Council of Switzerland has established a War Economy Syndicate for foodstuffs and has authorized other syndicates. Almost daily during the first half of September, the Netherlands instituted governmental control of some industry or other. Canada, however, did not establish exchange control until September 15, and the coal administrator was not appointed until October 18, although a sugar administrator had been appointed much earlier.

A number of the neutral countries, notably Greece and Nicaragua, subjected imports to licence systems. The Netherlands has established a monopoly to control imports of fish and fish products; Spain, a monopoly for scrap iron and steel; Ireland, for wheat and corn; and Greece, for sugar, coffee, dried vegetables, and codfish. The Netherlands renewed on October 5 a previous monopoly control of milk, butter, cheese and casein.

The trade agreements of the United States with Canada and with the United Kingdom, effective Jan. 1, 1939, gave the year 1939 a good start in stimulating international trade; but can one

entertain hope that the movement will go very far in the face of growing international difficulties of a political nature? The example set by these notable trade agreements has not been followed to any great extent, and even before the outbreak of war in Europe, the year 1939 saw more raising than lowering of trade barriers. The year closed with wars in Europe as well as in Asia, and probably less freedom of commerce than at any time since 1918. The trade agreement program of the United States is under such attack that some now predict its discontinuance. Nonetheless, this war will terminate, and among the millions compelled to ponder the possibility of establishing a stable and lasting peace, an increasing number are impressed by the necessity of restoring an ample and secure international trade. (See also TRADE AGREEMENTS.)

(B. B. W.)

Tasmania, area 26,215 sq.mi.; pop. (est. March 1939) 238,061. Chief towns: Hobart (cap., 64,950); Launceston (33,100). Governor: Sir Ernest Clark. A State of the Australian Commonwealth.

History.—The State suffered a severe loss in the sudden death of the Labour premier, A. G. Ogilvie, on June 10, after a notable career in public life. He had been at one time the youngest K.C. in the British Empire. Mr. Dwyer-Gray, the treasurer, succeeded him as premier without portfolio. Mr. Cosgrove was appointed deputy leader and treasurer, and delegated to succeed Mr. Dwyer-Gray in Jan. 1940; T. D'Alton became minister for agriculture, and E. Brooker chief secretary and minister for transport.

At its conference in April, the Labour party again urged introduction of compulsory military training. The budget revealed a deficit of £25,984 for the financial year 1938-39, and estimated a deficit of £57,754 for 1939-40. Pastoral and agricultural areas were less seriously affected than the mainland States by the adverse season, and stock remained in good condition. Work began at Boyer on the erection of a new paper mill, and plans were prepared for the development of iron ore deposits near Burnie, and for the establishment of magnesium works. Good progress was made with the pontoon bridge across the Derwent at Hobart.

(L. R. Mc.)

Finance.—Revenue (1938-39), £3,639,494; expenditure £3,635,999; public debt (June 30, 1938), £25,840,807.

Communications.—Dec. 31, 1937: roads, surfaced 21,000mi.; railways: Government 663mi.; private 131 miles. Motor vehicles licensed (Dec. 31, 1938): cars 16,648; trucks 4,511; cycles 3,646. Wireless receiving set licences (Dec. 31, 1938) 36,013. Telephones, subscribers (1937-38) 13,482.

Industries.—Production 1937-38: primary £8,032,000; secondary £5,445,000. Labour, 1937-38 average: factory employment 13,170 employees; unemployment (Trade Union returns) 7%.

Tatsch, Jacob Hugo (1888-1939), American Masonic leader and author, was born in Milwaukee on January 29. After spending 17 years (1905-22) in various banking positions at Spokane, New York city, Boston and Los Angeles he became in 1923 assistant secretary and assistant editor of the National Masonic Research society at Cedar Rapids, Iowa. The rest of his life was spent in a study of the Masonic movement, and he was the author and co-author of 11 volumes on the history of Freemasonry and biographies of several of its prominent leaders. During the World War he was a special agent for the Military Intelligence division of the U.S.A. and in 1935 he was promoted to lieutenant-colonel in the U.S. Army. He died at London on July 17.

Taxation. In the United States the most striking development since 1938 has been the comparative cessa-

tion of new taxing legislation, on the part of both Federal and State Governments. In the former field this was indicated by the absence of new taxes and of increases in existing taxes; by the final repeal of the undistributed profits tax of 1936; and by the refusal of the 76th Congress to adopt measures for broadening the income tax base or other new tax proposals.

In the field of State legislation no new sales, or chain store taxes have been enacted since 1938. In sales tax legislation, however, there has been a considerable tendency toward detailed revision of existing sales taxes, taking the form sometimes of expansion, sometimes of restriction, of the scope of commodities and services subject to the tax, and sometimes of the adoption of "use" taxes to prevent evasion of existing sales taxes.

The one most active field of State taxation throughout 1939 has been that of cigarette taxes—which in itself suggests the diminished volume of substantial tax legislation.

One factor which has potentialities for disturbing the more or less regular course of events in taxation is the widespread tendency to utilize the tax machinery to accomplish specific ends—social or otherwise.

This is a prerogative formerly supposed to be reserved to the manufacturing interests through their control of protective tariff policy. Popularized by the Federal Government in its agricultural program, undistributed profits tax, and elsewhere, it has now been embraced by numerous groups in the field of State and local taxation.

But the defeat of so-called "Ham and Eggs" proposals in California and Ohio and of other radical proposals for enlarged pension and relief programs in popular elections in various States would seem to suggest that this movement has passed its crest.

Summary of U.S. State Sales Taxes

State	Retail Occupational Tax	Retail Consumers' Sales Tax	Use Tax (Consumers' Privilege Tax)	Retail Gross Income Tax	Wholesale Gross Income Tax	Wholesale Licence Tax	Retail Licence Tax
Alabama . . .	2% ^a	..	2% ^a	..	..	..	..
Arizona . . .	2%	..	..	..	..	..	..
Arkansas . . .	..	2%	..	..	..	..	..
California . . .	3%	..	3%	..	..	..	..
Colorado . . .	..	2%	2%	..	..	..	..
Connecticut . .	.1%	..	..	..	.025%	..	..
Delaware . . .	..	..	..	..	..	Yes	Yes
Florida . . .	..	..	..	.5% ^b	..	..	..
Illinois . . .	3%	..	..	..	..	..	..
Indiana . . .	..	..	..	1%	.025%	..	..
Iowa . . .	..	2%	2%	..	..	..	..
Kansas . . .	..	2%	2%	..	..	..	..
Louisiana . . .	..	1% ^c	1% ^c	..	..	Yes	Yes
Michigan . . .	3%	..	3%	..	..	..	..
Mississippi . .	..	..	2% ^d	2%	.0125%	..	..
Missouri . . .	..	2%	..	..	..	..	..
New Mexico . .	..	..	2%	2% ^e	.0125%	Yes ^f	..
New York . . .	..	..	..	..	..	..	..
(N.Y. city only)	..	2% ^g	2%	.1% ^h	.1% ^h	..	..
No. Carolina . .	..	3% ^j	3%	..	.05%	Yes	..
No. Dakota . .	..	2%	2%	..	..	..	..
Ohio . . .	..	3% ^k	3% ^k	..	..	..	Yes
Oklahoma . . .	..	2%	2%	..	..	..	..
Pennsylvania . .	..	..	..	..	..	Yes ^l	Yes
So. Dakota . . .	..	3%	3%	..	..	..	..
Utah . . .	..	2%	2%	..	..	..	..
Virginia . . .	..	..	..	..	..	Yes	Yes
Washington . .	.25%	2%	2% ^m	..	.25%	..	..
West Virginia .	..	2%	..	.5%	.15% ⁿ	..	..
Wyoming . . .	..	2%	2%	..	..	..	..

^a .5% on automobiles. ^b Plus tax varying according to number of stores. ^c New Orleans also imposes additional like tax; use tax is based on cost price. ^d Lower rates for wholesaling, automobiles, etc. ^e Lower rates for automobiles, etc. ^f Dealers in merchandise. ^g Except sales of food and drink in restaurants; alcoholic beverages taxed at 3%. ^h In excess of \$10,000; 2% for financial business. ⁱ Plus \$1 annual licence fee. ^j No tax if price is under 9¢; 1¢ if price is 40¢ or less; 2¢ if price is over 40¢ and not over 70¢; 3¢ if price is over 70¢ and not over \$1.00; 3¢ on each dollar over one plus same scale as mentioned upon fractional dollars. ^k Also gross tax on dealers at exchanges. ^m "Compensating" tax on taxable personal property. ⁿ Also surtax.

Great Britain.—In European countries tax policies have been dominated by the enormous necessities of the war and of enlarged defence programs on the part of nations not yet involved in actual warfare. Great Britain has adopted the most drastic income tax in history, with a basic rate which, after April 1, 1940, will be 37½% on taxable income, and with surtax rates under which the total tax on the largest incomes will approximate 80% of the entire income. The British Government has also increased the estate tax by 10%; has adopted an excess profits tax of 60%; and has levied a number of additional excise taxes on beer, liquors, tobacco and sugar.

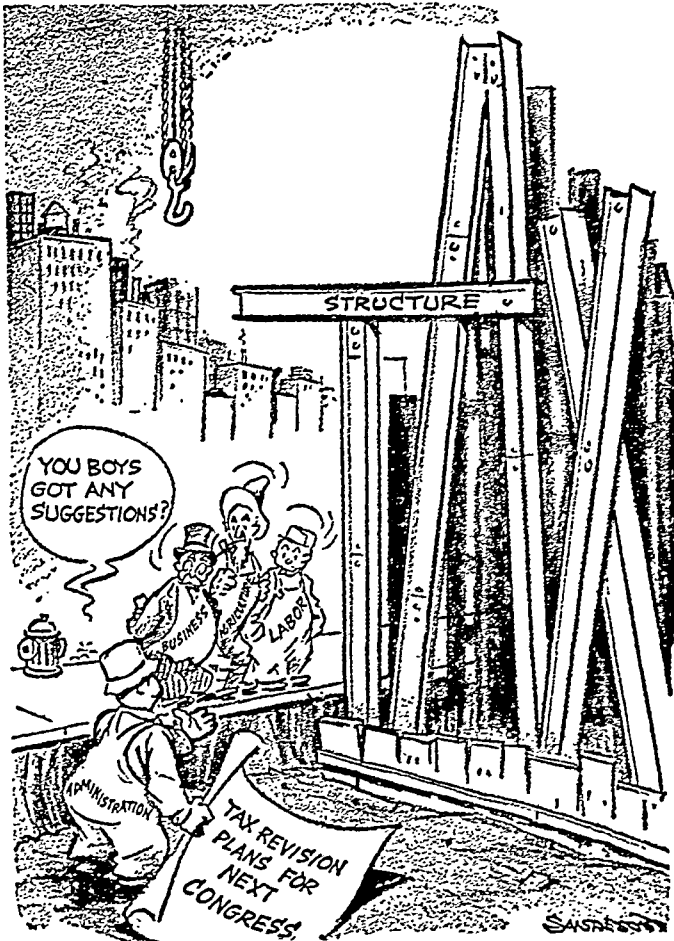
Canada.—Canadian tax policy may now be embraced within the general scheme of British war finance. Tax measures adopted in 1939 include:

A war surtax, superimposed upon its existing income tax, equal to 20% of the total income tax previously payable.
An excess profits tax of from 10% to 60%.
Increases in the corporation income tax, in the excises on beer, wine, spirits, tobacco, and some other articles.
Extension of the sales tax to types of transactions not formerly included.

France.—The French Government has levied a general sales tax, a series of special excise taxes, an excess profits tax and an extraordinary "national contribution" in the form of a special income tax on wages, salaries, pensions and commercial, industrial, agricultural profits—in addition to the ordinary income taxes.

Germany.—German revenue measures have largely taken the form of confiscation of Jewish property, the seizure of Austrian and Czech gold, and the expropriation of property in Poland. Among more regular revenue measures, Germany has increased the compulsory social insurance and social welfare contributions, has levied a variety of special income taxes, for example on bachelors, spinsters and childless couples, and a special surtax on individual and corporate incomes, and has increased the taxes on alcoholic beverages and tobacco.

Italy.—The Italian Government has moved with characteristic conservatism, probably in consequence of ample financial and industrial preparation previously made. Thus far it appears to have resorted to only two new taxes—a 2% general income tax



CARTOONIST SANDESON of The New Orleans Tribune pokes fun at the Administration's vague tax plans for 1940

and a capital levy of $\frac{1}{2}\%$ on all property.

On the whole, European nations, with the exception of Germany, appear to be determined to finance the costs of the present war through current taxation rather than through borrowing or through currency depreciation, with a view to avoiding or minimizing the disastrous results of the inflationary types of financing that characterized the World War (1914-18). If they succeed in accomplishing this, it will be an achievement of immense significance. But the continent of Europe is now in the unhappy position of devoting its economic and human resources and the major portion of its entire productive capacity to processes of destruction. What onerous types of taxation or of virtual expropriation this may ultimately involve, it is yet too early to determine. (See also INCOME TAX; INITIATIVE AND REFERENDUM; LEGISLATION, FEDERAL: *Revenue Act of 1939*; SUPREME COURT OF THE UNITED STATES: *Taxation*.) (H. D. SL.)

Tea. Great Britain requisitioned 50,000,000lb. of Ceylon tea and 130,000,000lb. of India tea and took control of the tea business in the United Kingdom at the outset of war in September. The Tea Brokers Association in London suspended the historic auction sales which in 1939 celebrated the centenary of their first sale. In the U.S., local prices rose five to ten cents a pound. In Canada a war revenue tariff of five to ten cents a pound was imposed September 12 on imports of tea. To relieve the temporary pressure on supplies, occasioned by British requisitions, the International Tea committee on October 6 raised the export quota of its three members, British India, Ceylon and Dutch East Indies (Sumatra and Java) from 90 to 95, thus providing an additional 40,000,000lb. to world supplies. The three countries exported a quota of 92½% in 1938, or 924,785,000 pounds. The increase in this quota, together with larger production in Nyasaland and Kenya, in effect gave a new record world supply of tea in 1939, *The Statist*, London, reported. The Tea Bureau, Inc., announced in September that there would be no recession in its "million dollar" advertising campaign in the United States in 1939 and 1940. The temporary interference with distribution, owing to the British Government's taking over supplies, led to a proposal that distribution could be simplified in the United Kingdom by establishing one standard blend of tea. Tea substitutes have appeared in Germany, because of the war blockade, and are said to consist of dandelion, lime blossoms and other dried herbs.

Formosa showed a heavy falling off in exports of black teas to the U.S. and Great Britain in 1939 because growers turned to the production of Pouchong tea in order to cultivate the Manchoukuo market. Government action, it was reported, will be taken by Formosa to prevent the restricting of black teas and the consequent loss of the U.S. and British markets.

U.S. Imports of Tea during Fiscal Years 1938 and 1939

(As reported by the *Tea and Coffee Trade Journal*, East Stroudsburg, Pa.)

	1939 lb.	1938 lb.		1939 lb.	1938 lb.
Black Teas			Green Teas		
Ceylon	23,565,670	20,519,083	Japan	8,851,412	11,766,610
India	17,461,660	13,156,679	Japan Dust . .	2,231,249	2,020,011
Blended C&I .	373,868	489,277	Ping Suey . . .	1,884,871	3,659,620
Java	14,220,328	13,910,001	Country Green	103,481	137,451
Sumatra . . .	8,494,629	6,679,107	Total Green		
Congo	1,721,146	2,724,244	Teas	13,071,013	17,583,710
Africa	173,155	48,813			
Formosa . . .	1,648,211	4,287,418	Oolongs		
Lapsang . . .			Formosa	5,056,467	3,583,320
Souchong . .	27,805	25,183	Cantons	262,456	330,043
Other Black			Total Oolongs .	5,318,923	3,913,363
Teas	1,358,477	1,440,017	All Others . . .	540,217	539,601
Total Black			Total	87,975,102	85,316,496
Teas	69,044,949	63,279,822			

(S. O. R.)

Technical Training: see EDUCATION, VOCATIONAL.

Technicolor: see MOTION PICTURES; PHOTOGRAPHY.

Telegraphy. The year 1939 was characterized by systematic efforts to decrease the cost and at the same time to increase the speed and the accuracy with which telegraphic business may be handled.

Sub-centre Switching, a means by which a group of patrons or small offices, each having a private line to a local central point, may be automatically connected, over a limited number of trunks, with a main telegraph office for the direct transmission of business in either direction, was brought to a high state of perfection.

Channel Selection, a further development of the sub-centre switching idea, made possible the concentration of feeder circuits from a number of towns or cities in switching equipment at large telegraphic centres with automatic switching facilities so arranged that the feeder points may switch themselves through to a number of distant points.

Ocean Cable Picture Transmission.—Improved apparatus and processes made possible the facsimile transmission by cable between Europe and America of photographs, printed or written matter, line drawings, etc., in much more satisfactory detail than had ever before been possible by any means. Synchronous operation of revolving drums 3,000mi. apart, an essential of such service, was insured by the use of electrically driven tuning forks.

Maximum Usage of Facilities.—Means for obtaining maximum usage of expensive trunk lines by use of the varioplex, carrier systems, etc., were brought to a greater degree of perfection; and direct connections, with consequent elimination of relays, were thus made increasingly available.

The Automatic Telegraph.—The facsimile process was successfully applied to the production of automatic sending devices, enabling a patron to deposit his telegram in a slot machine by which the message is automatically transmitted to a central telegraph office or other point.

Another field of facsimile transmission was opened up by the introduction of recording machines which reproduce exact copies of transmitted matter, in the form of stencils or carbon master sheets, from which a great number of mimeograph or hectograph copies may be made.

Vermilion coloured recording paper, used quite successfully in connection with the facsimile telegraph during recent years, has been replaced by a much more satisfactory gray recording paper ("teledeltos") which combines improved appearance and legibility at less cost.

The Cable Depthometer was brought to such a state of perfection that when dragged along the ocean floor it magnetically determines and records on shipboard, the location of a submarine cable and the depth at which it is buried in the ocean bed.

Wireless Telegraph Equipment, in mobile units to be used in times of emergency when wires may be prostrated because of storms, earthquakes, etc. was made a part of the regular equipment of commercial telegraph companies.

Portable Carrier Equipment.—For the derivation of one or two additional telegraph communication channels for emergencies, or for short term use where the existing conductors are all in service, an inexpensive portable voice frequency carrier terminal was developed. The carrier currents are superimposed on a pair of wires without altering services already existing. From one to four frequencies are employed, depending on the number and direction of transmissions required. (R. B. W.)

Teleki, Paul (1879—), Hungarian statesman. For his biography, see *Encyclopædia Britannica*, vol. 21, p. 893. Count Teleki was called upon Feb. 16, 1939, to form a new cabinet after the serio-comic episodes leading to the resignation of Premier Bela Imredy, an ardent anti-Semite who discovered that his great-grandfather was Jewish. Teleki on February

24 ordered the dissolution of the Hungarian Nazi Party and the imprisonment of its leaders. On May 29 his Government received a substantial majority in the parliamentary elections, though the Nazis gained a number of seats. The position of Teleki's cabinet in the early days of the European war was a rather delicate one. Though traditionally friendly with the Poles, Hungary was obviously unwilling to antagonize Hitler. On August 26 Teleki's cabinet refused Rumania's proffered non-aggression pact and proposed instead a treaty that would guarantee minority rights in both countries. On September 14 Hungary declared its neutrality. The next week diplomatic relations with Russia, severed since February 2, were resumed.

Telepathy: see PSYCHICAL RESEARCH.

Telephone. Many technical advances in the past decade have led to the attainment of notably higher standards of telephone service. Outstanding among them are important improvements in the design of the telephone transmitter and receiver and the other apparatus placed in subscribers' premises, and improvements and extensions in line and radio facilities for long distance communication. The use of dial telephone equipment in central offices has continued to expand beyond the point at which it stood in 1938.

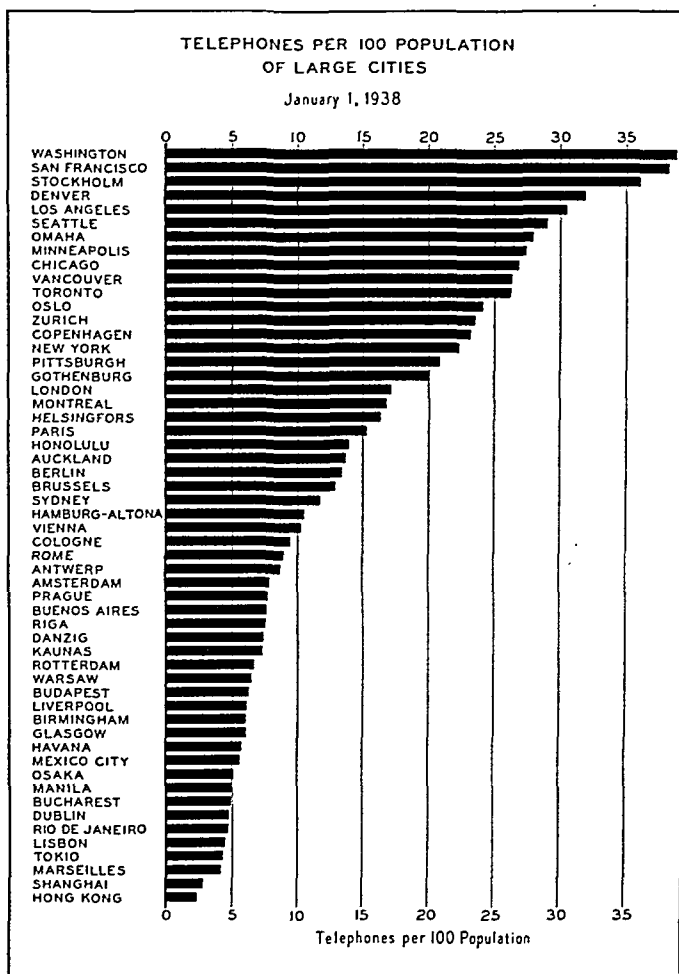
The first overseas radio telephone channel was that between the United States and England, opened for service in 1927. Progress in this field has been so rapid and the demand for international telephony has been so insistent that since 1927 more than 175 overseas radio telephone circuits for the handling of public message business have been created and cover the earth as an invisible yet very substantial network.

The original radio telephone channel between the United States and England (it is still in use) employs frequencies lying in the long wave-length range. It has from the outset used the single-sideband type of transmission. More recently, the technical problems presented by the application of the single-sideband principle to short wave-length channels have been overcome, thus effecting important economies in the use of a very important, but limited, range of wave-lengths. Twin operation now occurs on two transatlantic channels.

Today 98% of the world's telephones are interconnected. Behind this rapid advance in international telephony stand, of course, important developments in the instrumentalities of radio communication. Notable among these may be mentioned water-cooled vacuum tubes of large power, greatly improved antennas, and improved auxiliary devices for the more effective overcoming of the interference which is inevitably associated with radio transmission.

Additions of very fundamental importance are continuing to be made to the long distance land lines, both in the United States and in Europe. Wherever possible these additions take the form of lead-covered cable, each cable containing several hundred distinct circuits. The advantages of cable circuits as compared with open-wire lines arise particularly from their increased electrical stability and freedom from failure because of storms, and hence increased reliability in service. The year 1939 has also seen the introduction of notable improvements in exchange telephone cables. As many as 3,000 wires of No. 24 gauge and 4,200 wires of No. 26 gauge are being placed within a lead sheath of 2½ in. over-all diameter. Previously, 3,600 No. 26 gauge wires represented the maximum. This increase has been achieved by improvements in insulation whereby wires can be arranged more compactly.

Carrier Methods.—In spite of the fact that the usual toll cable carries as many as 200 to 400 individual lines, the problem of multiplexing these lines by the "carrier" principle has assumed economic importance. The development of a very successful



twelve-channel system has been effected and so far as the United States is concerned, numerous installations are under way.

Coaxial Cable.—The coaxial cable, an additional instrumentality for providing more abundant long distance circuits, has successfully passed its trial stage. In the hands of American telephone engineers it has already been demonstrated as capable of providing as many as 500 telephone channels over a distance of 2,000 miles. The first section for regular telephone and telegraph service is undergoing installation between Minneapolis, Minn. and Stevens Point, Wis. a distance of about 200 miles. In brief, the coaxial cable operates on the multiplex or carrier principle, enabling two pairs of conductors (each pair consisting of a wire surrounded by a concentric metal pipe and used to transmit in one direction only) to provide a large group of telephone channels or, alternatively, a single television channel, depending upon the range of the filters and the amplifying devices or repeaters with which the cable is equipped. In Europe—notably England, France, and Germany—the coaxial cable has been more stressed as a conductor for the point-to-point transmission of television programs than as an adjunct to the telephone. Both uses are, however, closely allied.

By far the major portion of the development work upon the coaxial cable has necessarily centred on the amplifying and filtering (or band-splitting) devices which are needed. The transmission loss of the cable is such that the message currents must be re-amplified every five to ten miles, while the filters used to separate the hundreds of messages from one another without extravagant waste of the frequency bands separating the channels represent virtually the ultimate limit of refinement.

Crossbar Office.—The transformation of central office equipment from the manually-operated to the dial-operated type has

proceeded steadily both in the United States and in Europe. The important new dial system designated by the term "crossbar," which was introduced into daily operation in 1939 in New York city, has continued to expand.

Lynn, Mass., has become the first city to be served entirely by crossbar offices.

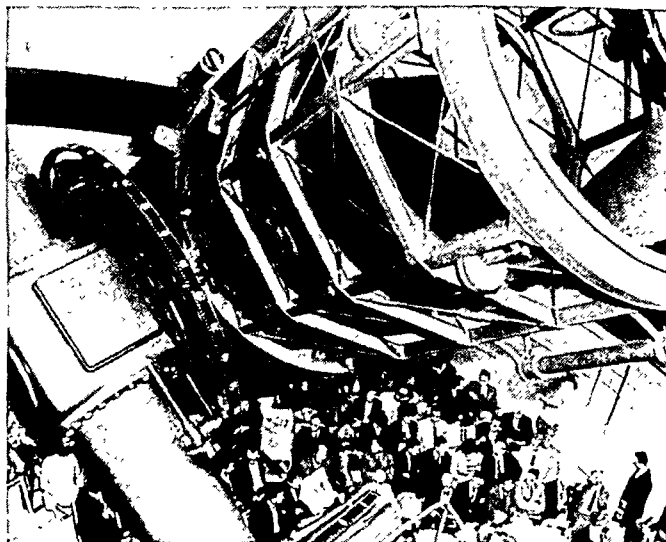
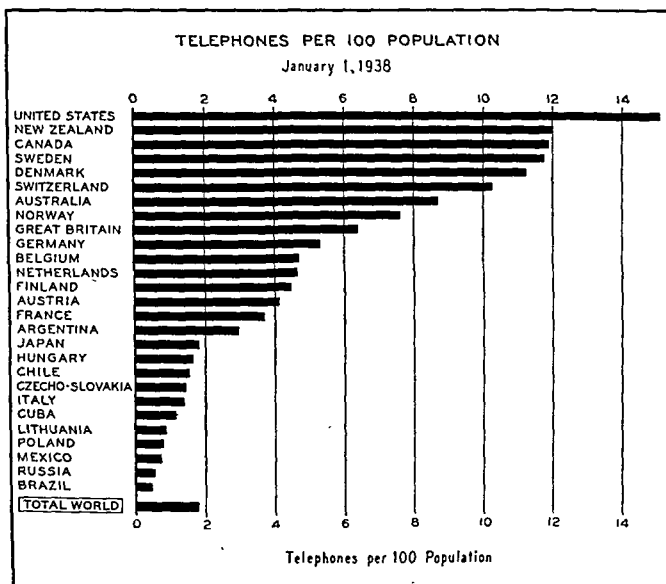
Toll Dial System.—The important field of application of the dial system is for handling local traffic. Both in Europe and in the United States, however, it is being employed to an increasing degree for the completion of toll calls. Toll dialing has been in use in Switzerland and Belgium, as well as in certain districts of the United States, and during the year 1938 two areas in the State of Ohio were converted from manual to dial toll. One of these embraced Dayton, Springfield and Columbus, and the other Cleveland, Akron, Canton, Alliance and Youngstown.

Miscellaneous Developments.—The use of harbour radio to furnish telephone service to coastal and harbour vessels has assumed notable importance. By the end of 1939 there were 15 land stations in the United States equipped for this service and more than 1,600 boats had connecting equipment. The land stations are associated with the wire telephone network so that the boats have at their disposal the full range of local and long distance connections.

Telephone emergencies are sufficiently frequent to have warranted the development of special radio facilities that can be used for the temporary bridging of gaps in the wire plant. Radio was thus used to notable advantage in the case of the New England hurricane in 1938. A radio unit now standard in the Bell System includes a gasoline engine for power supply, a demountable antenna, and means for connecting to any standard telephone circuit. The outfit weighs less than 500lb. and is in a form convenient for rapid transportation and installation.

The year 1939 inaugurated a service in New York city whereby telephone customers may obtain the latest weather information and forecasts by calling or dialing WEather 6-1212. The reports are recorded upon endless magnetic tape and the equipment is so designed as to transmit at the proper sound level to as many customers as may be simultaneously connected to the Bureau. Chicago also began the service in 1939 and similar projects are under way for other large cities.

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MCDONALD OBSERVATORY, on Mount Locke, Tex., was dedicated May 5, 1939, with 400 distinguished guests attending

Telescopes. The following list of large telescopes represents the most important instruments completed or now under construction:

200-Inch Reflecting Telescope (F 3.3) of the California Institute of Technology. To be operated in co-operation with the Mount Wilson Observatory of the Carnegie Institution of Washington. Located on Palomar mountain in Southern California. Dome, 135ft. in diameter, and major portions of mounting, weighing 500 tons, completed and erected. Optical figuring of 200-in. mirror on its supporting system still in progress. Auxiliary mirrors partially figured and spectrographs and plateholders largely designed.

82-Inch Reflecting Telescope (F 4) of the McDonald Observatory. Operated jointly by the University of Texas and the University of Chicago. Located on Mount Locke in Western Texas. Completed and in regular operation.

76-Inch (193 cm.) Reflecting Telescope of the Observatoire de Haute-Provence, France. Established by the Service d'Astrophysique de la Caisse Nationale de la Recherche Scientifique. Located near Saint-Michel (Basses-Alpes). The large mirror has been cast and is now being figured. Two other reflecting telescopes with apertures of 31in. (80 cm.) and 47in. (120 cm.) have been completed.

74-Inch Reflecting Telescope (F 4.9) of the Radcliffe Observatory, Oxford. Located at Pretoria, South Africa. Mirror figured and nearly ready for aluminizing and dome and buildings erected.

72-Inch Twin Photographic Refracting Telescope (F 7) of the Lick Observatory of the University of California. To be located on Mount Hamilton, California. Mounting completed but not erected and the figuring of one lens well advanced.

Several large telescopes of the Schmidt type with wide fields and of great photographic efficiency are under construction. Among these are:

48-Inch Schmidt Telescope (F 2.5) of the California Institute of Technology. Planned as an adjunct to the 200-in. telescope. The disc for the 72-in. spherical mirror is now being figured and the glass for the 48-in. correcting plate has been secured. The dome has been erected and the mounting is under construction. A large objective prism will be used with this instrument.

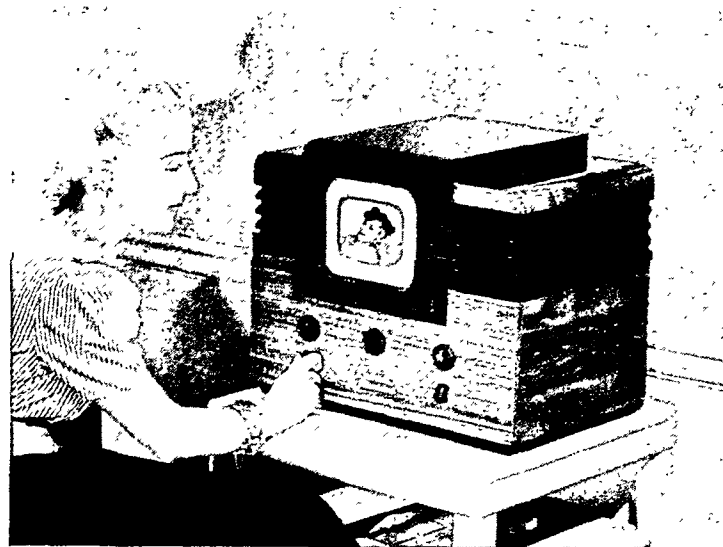
39-Inch Schmidt Telescope (F 2) of the Hamburg Observatory, Bergedorf, Germany. Provided with a 39-in. spherical mirror.

These last two instruments are under construction at the Zeiss works in Jena.

The principle of the Schmidt telescope has been applied most successfully to spectrographic cameras at the coudé focus of large reflecting telescopes. Notable cases are with the McDonald reflector and the 100-in. telescope at Mount Wilson where a 36-in. concave mirror is in regular use with the 100-in. telescope. Correcting lenses designed by Ross to increase the field of good definition of reflecting telescopes are also coming into more general use. After considerable experimentation several lenses of this type are being designed for the 100-in. and 200-in. telescopes in California and the 82-in. reflector in Texas. (See also ASTRONOMY.)

(W. S. Ad.)

Television. Throughout 1939 developments in television continued to hold international interest. As before, the most important application appeared to be in the field of



Above, left: THE FIRST TELEVISION SETS were placed on sale in Apr. 1939

Above, right: THE FIRST U.S. SPORTS EVENT ever televised was a Princeton-Columbia baseball game in New York city, May 17, 1939

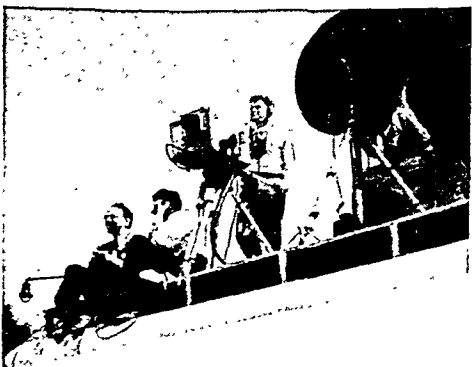
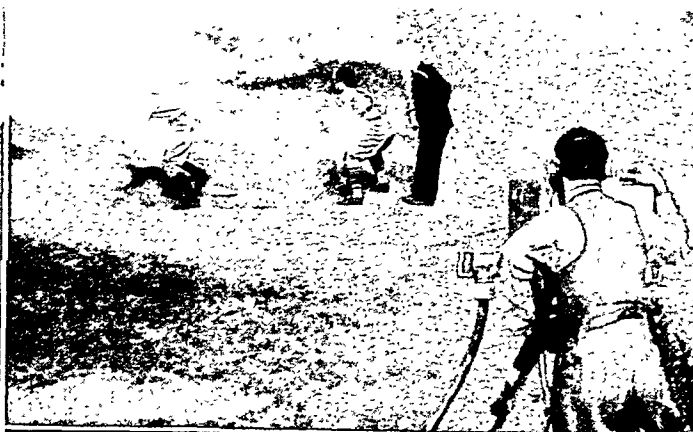
Upper centre: THE RECEPTION IMAGE of the telecast sports event just above—a Princeton-Columbia baseball game

Lower centre: A TELEVISION RECEIVER in a plane four miles above Washington, D.C., on Oct. 17, 1939, clearly recorded the image of David Sarnoff and W. A. Patterson sitting at a desk in New York city, more than 200 miles away

Below, left: TELECASTING A SPECIAL EVENT from the top of a "mobile unit" truck in 1939

Below, centre: A FILM SCANNER developed in 1939 makes possible the transmission of motion pictures by television without distortion or blur

Below, right: FIRST TELECAST OF A FOOTBALL GAME—Fordham vs. Waynesburg at Randall's island, N.Y., Sept. 30, 1939



home broadcasting, and in this service further explorations and improvements were made in many countries, including the United States, Great Britain, France, Germany, Spain, Italy, Argentina and the Netherlands. Television as an adjunct to toll telephone lines, for personal intercommunication by sight as well as by sound, was extended in Germany, where it is reported that such dual connections have been provided between public pay stations in Leipzig, Nuremberg and Munich as well as to or between four operating points in Berlin. In the German stations, large reproducing screens are reported in use as giving images approximately 18"x24" in size, while similar two-way installations in Spain and Buenos Aires have utilized smaller cathode-ray reproducers. Military applications of television are the subject of intensive study, as are also direct commercial uses from which it is hoped to derive an income for the support and development of the art.

In Great Britain, television broadcasting (begun in late 1936) was continued until blacked-out by the European war. A number of new models of television receivers were put on the market, almost all of them using cathode-ray tubes. Varying picture sizes, from the small images provided by tubes of 5" screen diameter up to the larger views made possible by 15" tubes, became available at a wide range of prices. The major improvements shown by the new model receivers were directed toward simplification of tuning and adjustment.

Television broadcasting in New York was re-inaugurated in April 1939, the new 441-line high definition standard having been adopted, and about a dozen hours per week of visual-and-sound programs have been sent out since then. The wavelength used is approximately 6.3 metres (44-50 megacycles per second) and the service radius is said to be 30mi. or more. Several manufacturers have offered television receivers to the public, these sets using cathode-ray tubes of from 5" to 20" diameter and the price range extending from about \$150 to approximately \$600. The lower-priced receivers usually provide picture reproduction only, and require association with an ordinary broadcast receiver for the rendition of the accompanying sound.

Other cities in the United States also have experimental television stations, but in no case is the program service rendered as extensive as in the older art of aural broadcasting. The Federal Communications Commission has released a report on television, in which recommendations are made for the allocation of the seven principal channels to potential television transmitters in a large number of cities in the U.S.A.

The commission has also proposed new "rules" for the regulation of television in the U.S.A., and suggests two general categories of television transmitters, one aimed at technological development and unrestricted as to transmission standards, the other directed largely toward program development and tests of public acceptance and therefore required to use the 441-line standard recommended by the Radio Manufacturers Association and adopted by a number of organizations which have put television receivers on public sale. Public hearings for discussion of these regulations have been called, to be held in Washington early in 1940. There appears to be some question as to whether any fixed standard, such as 441 lines, should now be adopted in view of the possibility that better and larger pictures may later be made available on some other basis.

French and German extensions of television broadcasting, like those of Great Britain, are understood to have been restricted by the European war although prior to Sept. 1939, they were progressing in normal fashion. In Germany the largest organizations interested in television broadcasting had co-operated in the design of a series of standard television receivers for introduction to public use, but no information is available as to their present

status. Among presently neutral European nations, Italy had installed a complete television studio and transmitting equipment in Rome, and Holland had carried forward investigation and construction of high-definition apparatus.

There is obviously a striking similarity in the technical work being carried on in various parts of the world. Although the economic problems of television in one country appear to differ from those in another, the physical and electrical problems are very nearly identical everywhere. Lay observers ask for larger reproduced pictures, more brilliance (so that the room need not be darkened) and still more pictorial content than has so far been proved practical.

Scientists say that the present size, brilliance and definition of television reproductions is on a level of perfection thought impossible only a few years ago, and that today's results should be accepted as a technological accomplishment of the maximum magnitude. So a question arises as to the economic situation of television: If those who supply insist that the system is acceptable and of service value, but those who are expected to buy retort that they will have none (or very little) of it, what is the answer?

To consider the two nations in which perhaps the greatest progress has been made, in Great Britain the expense of installing television transmitters and of providing programs is paid by the general tax on all broadcast receivers, whereas in the United States the cost of all development of apparatus and programs must be met by individuals or organizations that are willing to speculate huge sums in the expectation that eventually the system will rest upon a sound economic base. Wide apart as these two positions may seem at present, it is probable that they will finally approach each other, for neither taxation nor private capital could be provided indefinitely for the sustenance of a venture that failed to provide a useful public service. The fact that funds have been made available for world-wide television research and development, and in large amounts, is probably a sound indication that it is entirely justifiable to believe in the future of television. The system should offer vast opportunities for both service and profit, once the economic problems are solved. (See also BROADCASTING.)
(J. V. L. H.)

Tellurium. The production of tellurium, like that of selenium, is largely confined to the United States and Canada, as a by-product of the copper refineries. United States production was 51,400lb. in 1937, but only 11,100lb. in 1938; Canadian production has been steadily increasing since 1934, and in 1939 reached 48,200 pounds. Production could be considerably increased if uses demanded it, but increases in consumption have been slow, since most of them required only small amounts; for example, one of the important new uses is as a hardener for chemical lead, but the percentage of tellurium required is so small that the maximum demand for this use does not exceed 50-75 tons annually.
(G. A. Ro.)

Tempelhof Airport: see AIRPORTS.

Temperley, Harold William Vazeille (1879 - 1939), British historian, was born on April 20 and was educated at King's college and Peterhouse, Cambridge. From 1904 to 1938 he taught at Peterhouse; he also lectured at Harvard (1911-12) and Stanford (1936) in the United States. Temperley first came into prominence when he published his *Life of George Canning* (1905). This work was followed by *Frederick the Great* (1915), *History of Serbia* (1917) and other works, the most notable of which was *The Foreign Policy of Canning* (1925). Temperley was the official British historian of the Paris peace conference and was co-editor

of British documents on the origins of the World War. From 1933 to 1939 he was president of the International Historical congress. He died at Cambridge on July 11.

Templeton, Fay (1865–1939), a favourite U.S. operetta singer of the late 19th and early 20th centuries, was born on Christmas day at Little Rock, Ark., the daughter of an opera director and a singer. She made her theatrical debut at the age of three in the role of Cupid, and at 15 she was playing important parts in light operettas. She later joined the famous vaudeville team of Weber and Fields and with them made a national success of the song "Rosy, You Are My Posy." Her best-remembered appearance was in George M. Cohan's *45 Minutes from Broadway* from 1905 to 1907. In the latter year she announced her retirement, but she returned to the stage in later years in Gilbert and Sullivan roles, and her last appearance was in *Roberta* in 1933. She died October 3 at San Francisco.

Tennessee, the sixteenth State to enter the Union, popularly known as the "Volunteer State"; State flower, iris; State bird, mocking-bird; area, 42,022 sq.mi.; population according to the U.S. Census of 1930, 2,616,556; estimated July 1, 1937, 2,893,000. Capital, Nashville, 153,866. The only city with larger population is Memphis with 253,143. Of the State's population, 896,538 or 34.3% are urban; 2,138,619, white; 477,646, coloured; 2,125,553 native-born white; 13,066 foreign-born white.

History.—Governor, Prentice Cooper; secretary of State, A. B. Broadbent; attorney-general, Roy Beeler; commissioners as follows: agriculture, C. C. Flannery; conservation, J. Charles Poe; education, B. O. Duggan; finance and taxation, George McCandless; highways and public works, C. W. Phillips; institutions, A. T. Taylor; welfare, Paul Savage; insurance and banking, J. M. McCormick; labour, S. E. Bryant; public health, W. C. Williams; railways and public utilities, W. D. Hudson, Porter Dunlap and Leon Joroumlan. Commissioner of administration has been discontinued in 1939, and institutions and public welfare were separated. The last legislature passed a marriage law requiring premarital examinations after 1940. It also repealed the 30-year old prohibition law, thus leaving package sale of liquor to local determination.

Education.—Percent of illiteracy in 1930 for whites was 5.4, for coloured 14.9. Of 5,764 elementary schools 1,467 had 3 or more teachers in 1938, one-teacher elementary schools declined from 3,555 in 1927 to 2,684 in 1938. Enrolment in elementary schools was 522,138. In 1938, all but 17.3% of elementary teachers had more than high school training; 27.0% were college graduates. The State maintains seven institutions for higher learning with an enrolment at the regular session of 9,791 students in 1937–38. The estimated valuation of these was \$15,050,001 in 1935. In addition there were separate schools for the blind, the deaf and underprivileged children; three State hospitals for the insane; a home and training school for feeble-minded; and four training or correctional schools, respectively for white boys, Negro boys, white girls and Negro girls; a commission and workshop for the blind; and two State penitentiaries.

Finance.—In 1939 there were 72 national banks with 17 branches, and 228 State with 33 branches, with assets of \$456,633,677 national, and \$154,757,323 State. Building and loan associations numbered 52 with assets of \$28,061,067. Insurance payments made by policyholders amounted to \$61,179,514 in 1938. In 1938 there were 547 companies licensed to write insurance in the State.

Agriculture.—There were 273,783 farms in 1935; 1,308,420 farm population; 19,085,837 acres in farms with 6,134,200 acres

of crop land harvested. Estimated value of crop production was \$85,537,000 in 1938. Corn 2,689,000ac., 68,570,000bu.; cotton, 791,000ac., 487,000 bales; hay, 1,660,000ac., 1,850,000 short tons; tobacco, 126,000ac., 111,855,000 pounds. Cattle on farms Jan. 1, 1939, were 1,170,000; hogs, 1,154,000; horses and mules, 453,000. Cash farm income from crops was \$70,380,000 in 1938; from livestock and livestock products \$55,578,000; Government payments to farmers were \$12,320,000; while the gross value of agricultural production for the State was \$174,198,000. Cash farm income was \$125,958,000 in 1938. Tuberculin testing of all cattle in the State was completed in 1935. Commercial forest area in 1929 was 14,000,000 acres. The cut in 1935 was 337,008,000 bd.ft., total value of lumber products \$11,944,159 of which \$6,831,597 were added by manufacture.

Manufactures.—In 1937 there were 1,991 manufacturing plants yielding products valued at \$707,986,784, of which \$295,626,708 constituted value added by manufacture. Value of mineral production was \$34,893,847 in 1937. Bituminous coal production in 1937 was 5,212,471 short tons; phosphate rock 899,298 long tons. Value of phosphate rock produced was \$3,725,601 in 1938. Manufacturing and urbanization are making marked progress in the State.

The Great Smoky Mountain National Park with 174,230 acres in Tennessee attracted 761,567 visitors for the year ending Sept. 30, 1939.

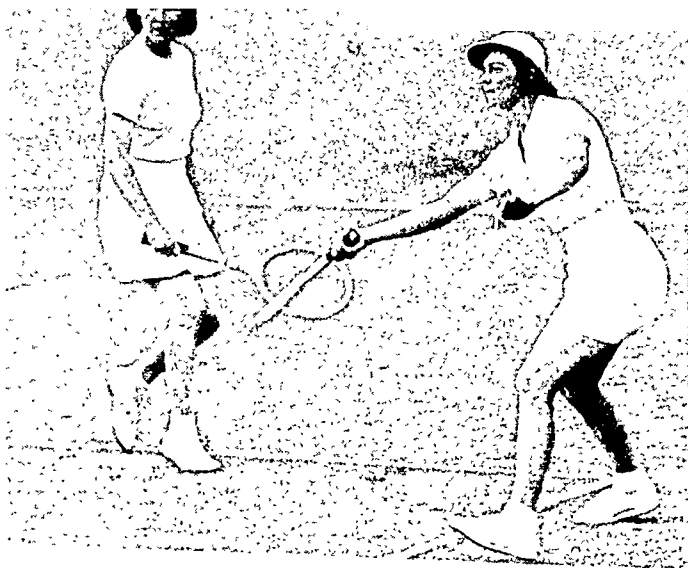
(C. E. A.)

Tennessee Valley Authority. Kentucky dam, near Gilbertsville, Ky., 22.5mi. above the mouth of the Tennessee river was under construction in 1939. Largest of the Authority's projects, this dam will be 160ft. high and 8,650ft. long. Its reservoir of 256,000ac. will hold 6,100,000 ac.-ft. of water; its navigation lock, 110 by 600ft., will have a maximum lift of 73 feet. The Kentucky dam reservoir will create 184mi. of navigable channel extending to Pickwick Landing dam and be able to store enough flood waters to cut two feet of Mississippi river flood crests. This is equivalent to preventing flood damages in excess of \$100,000,000. Present plans do not include an initial power installation at Kentucky dam. Estimated cost is \$95,000,000.

Watts Bar dam is being built at the head of the projected Chickamauga reservoir. This latest project of the Authority will be 2,970ft. long and 97ft. high. Its 72-mi. long reservoir will extend the navigable channel upstream to Lenoir City. The lock at the dam will have a 60 by 360-ft. chamber and a maximum lift of 70 feet. The reservoir, 41,500ac. in area, will hold 1,132,000 ac.-ft. of water. Initial power installation will be three 42,000-h.p. generating units. One more dam has been recommended for construction by the Authority, the Coulter Shoals project near Lenoir City. A dam at this point would complete the improvement of the Tennessee river to Knoxville.

In its peacetime utilization of the Federal munitions plants at Muscle Shoals, the Authority is manufacturing highly concentrated phosphatic fertilizers. These products, containing from 43% to 65% available plant food, are being tested by agricultural agencies in more than 40 States and by nearly 26,000 practical farmers in 20 States. By Aug. 1, 1939, some 240,000 tons of these plant foods had been distributed to these agencies and farmers for test purposes and to the Department of Agriculture for distribution at cost in lieu of benefit payments.

Since 1933, about 500,000ac. of farm lands in the valley have been terraced. Severe erosion on farms totalling approximately 1,000,000ac. has been checked. Accurate soil surveys of more than one-third of the region's 41,000 sq.mi. have been made. About 100,000,000 trees have been planted, the majority of them on privately owned land to help restore submarginal areas.



SARAH PALFREY FABYAN (left) and Alice Marble of the U.S.A. formed the best women's doubles team of 1939, winning both the Wimbledon championship and the Wightman Cup

In addition, research is conducted with a view to demonstrating new farm equipment and the local processing of the region's farm crops through the application of electrical methods.

The Authority is directed by statute to give preference in the sale of its surplus electric energy to States, counties, municipalities, and co-operative associations. Following a policy of non-duplication of existing facilities, it co-operated with municipalities and co-operatives in the purchase of existing utility distribution systems in the region. The largest of a series of such purchases is the acquisition of the electric properties of the Tennessee Electric Power Co. by the Authority and 34 municipalities and associations.

By Sept. 15, 1939, TVA power was being used by approximately 320,000 ultimate consumers, about 270,000 of whom were residential and farm customers. The power was being distributed by 61 municipalities, including the cities of Knoxville, Nashville, Memphis, and Chattanooga, Tenn., 28 rural co-operative associations, and in several districts operated temporarily by the Authority. In addition, TVA sells power to power companies and industrial plants, and uses its electricity for dam construction, and in its fertilizer plant at Muscle Shoals.

The TVA residential rate schedule is as follows:

- 3¢ per kw.-hr. for first 50 kw.-hr. per mo.
- 2¢ per kw.-hr. for next 150 kw.-hr. per mo.
- 1¢ per kw.-hr. for next 200 kw.-hr. per mo.
- 4 mills per kw.-hr. for the next 1,000 kw.-hr. per mo.
- 7½ mills per kw.-hr. for all over 1,400 kw.-hr. per mo.

The Authority is headed by a three-man board of directors whose policies are executed by a general manager. Following disagreement among members of the board and consequent removal of the then chairman, Dr. Arthur E. Morgan, by the President, Congress ordered an investigation of the Authority by a joint Congressional committee. The findings of the majority of the committee, reported April 1, 1939, cleared the Authority of the charges against it and concluded that "The Authority should be regarded as a settled and established institution in the Valley. Its construction program should be carried to completion so that money already invested may not be wasted or inadequately supported by revenue. The agricultural, forestry, public health, and other regional development programs of the Authority are generally acknowledged to be beneficial to the region and to the nation as a whole, and should be continued. The Authority has already dem-

onstrated the value of unified river control under public management. It is on the way to full demonstration of the practicability of promotional rates for domestic electric service, which may be adopted as well by private utilities as under public ownership."

Both the constitutionality of the Authority and its right to dispose of surplus power have been attacked in numerous suits since the Authority's inception.

The Authority was upheld in two major litigations that were carried to the Supreme Court, in the first, the "Ashwander Case," by an 8-to-1 decision on Feb. 17, 1936, and in the second, the so-called "18 Utilities suit," by a 6-to-2 decision on Jan. 30, 1939. (See also ELECTRICAL INDUSTRIES; PUBLIC UTILITIES; UNITED STATES.) (H. A. MN.)

Tennis. The tennis season of 1939, fortunately completed despite the outbreak of another war in Europe, was a year of indifferent play and championships won in most instances by mediocre players. There was no outstanding star, no one like the Vines of 1932, the Crawford of 1933, the Perry of 1934 and 1936, or the Budge of 1937 and 1938, but a number of rather colourless performers in different lands.

The first major championship of the year was held at Melbourne, Victoria, in January. John E. Bromwich, the home star, won two of the three Australian titles, the singles, and the doubles with Adrian Quist. He took the singles without the loss of a set, defeating Quist in the finals. In June the French championships saw the straight set defeat of Robert E. Riggs of the United States by his compatriot, Donald McNeill. Riggs in 1938 was ranked second and McNeill thirteenth in the United States.

In the Queen's club championships the end of June, Riggs got only one game from Gottfried von Cramm, the former German champion, in the semifinals. However he atoned somewhat for these defeats by capturing the singles at Wimbledon in July, defeating his compatriot Elwood T. Cooke in a long and dull five-set match in the finals, remarkable for the fact that many of the gallery left in the middle. The field was much better in the women's events which were won by Miss Alice Marble, the champion of the United States. She took her last two contests with the loss of but two games, those to Miss Kay Stammers of England in the finals. What may perhaps be the last Wimbledon for some years was on the whole replete with undistinguished play.

Yugoslavia won the finals of the European zone of the Davis Cup in July, defeating the Germans by three matches to two at Zagreb. In the Interzone finals at Boston in August, Franjo Punccec, the leading Yugoslav, beat a most indifferent Bromwich, but the Australians had no trouble winning the other matches and qualified to meet the United States in the challenge round, four to one.

Two Australian pairs gave the home players a lesson in doubles, and the title of the United States was won by Quist and Bromwich who defeated their teammates Crawford and Hopman in straight sets. The challenge round of the Davis Cup, held at the Merion Cricket club in Philadelphia was, like its predecessor of 1914, upset by war and war's alarms. The sensation of the meeting was the recovery of the challengers from an apparently hopeless position on the evening of the first day. Bromwich and Quist lost their matches to Riggs and Parker, respectively, on the afternoon of Saturday, September 2, as England was preparing to declare war against Germany. Once the die was cast they found their form, won the doubles the next day, and on September 4 Quist defeated Riggs in straight sets and Bromwich swamped Parker. This gave them victory by three matches to two, and the Davis Cup went into Australia's possession as it did on the eve of war 25 years ago.

The championship of the United States on September 7 at Forest Hills was won by Riggs, but the surprise was the play of Welby

Van Horn, a 19-year-old high school boy from California who defeated Wayne Sabin in the quarter-finals and Bromwich in the semi-finals in five sets, being two sets to love down in both matches. Riggs in the finals cleverly used a bad wind and by playing good, sound tennis was on top of Van Horn all through the three sets.

Miss Alice Marble repeated her Wimbledon triumph, but Miss Helen Jacobs in the finals played even with her until the tenth game of the third set in a dramatic and vivid match in which the champion of 1938 was extremely lucky not to be beaten by the courage and court tactics of the champion of 1935. There were few contests anywhere in amateur tennis in the summer of 1939 which held one's interest and attention as did this women's finals at Forest Hills in the middle of September. (J. R. Tu.)

Texas, south-central State of the United States, first a colonial possession of Spain and later a part of Mexico, became an independent republic in 1836 and was admitted to the United States in Dec. 1845. It is sometimes called the "Lone Star State," because of the State flag with a single star. Area, 265,896 sq.mi. (largest in the Union); population (U.S. census, 1930), 5,824,715; (estimated, 1939) 6,300,000. Capital, Austin, population (estimated, 1939), 90,000. The three largest cities, with population estimated, 1939, are Houston, 400,000; Dallas, 370,000; San Antonio, 315,000. Of the State's population in 1930, 2,389,348, or 41%, were urban; 4,283,491 were whites (89,396 foreign born); 854,964 coloured; 686,260 other races (683,681 Mexicans). The coloured population is heaviest in eastern Texas, the Mexican in south-western Texas.

History.—The dominant figure in State politics throughout 1939 was the governor, W. Lee O'Daniel, elected the year before on a platform calling for pensions of \$30 per month (half to be paid by the U.S. Government) for all persons over 65 years of age. Controversy over the governor's social security program made the session of the 46th legislature, which opened in Jan. 1939, the longest in the State's history and one of the most turbulent. A bill known as Senate Joint Resolution 12, sponsored by the governor, would have submitted to popular vote a constitutional amendment embodying a sales tax and a tax on natural resources, but with a permanent "ceiling" on the latter that could not be raised. The measure was opposed by 56 members of the lower house, sufficient to prevent passage.

Another bill, passed by the legislature and signed by the governor, added 50,000 old-age pensioners to the 118,000 already on the rolls, but no money was appropriated, and the sums received by the pensioners decreased within the year from an average of \$14 to about \$8 per month. For the first time in many years there was no special session of the legislature, as the governor refused to call one.

Other leading officials of the State were Coke R. Stevenson, lieutenant-governor; Gerald Mann, attorney-general; Charlie Lockhart, treasurer; Bascom Giles, commissioner of general land office; J. A. McDonald, commissioner of agriculture; L. A. Woods, superintendent of public instruction; George H. Sheppard, comptroller; the railroad commission is composed of Ernest O. Thompson, Lon A. Smith and G. A. Sadler.

Education.—The State maintains a general system of public schools, extending from the primary grades to colleges and a university.

In 1939 the scholastic population, from six to seventeen years inclusive, was 1,566,544, of whom 244,841 were coloured. The schools below college rank are supported by both local taxes and State funds.

The latter, apportioned at \$22 per pupil, totalled \$34,463,968. Fully accredited four-year high schools number 1,193. The State

also supports 16 institutions of higher learning, including one for Negroes. There are more than 20 denominational and privately endowed colleges.

Charities and Correction.—The State maintains 22 eleemosynary institutions. Half of these are hospitals for mental and nervous cases; a new one was completed at Big Springs in 1939, but accommodations for such cases were still inadequate. There are also two sanatoriums for tuberculosis victims; schools for the blind and for the deaf (white and coloured); two homes for delinquent children; two for white orphans and one for coloured; one for defectives; one for crippled children. There is a home for Confederate veterans and one for the widows of veterans. A number of homes for orphans and for crippled children are supported by private means, religious sects and fraternal orders. The State prison system is extensive; the principal unit is the penitentiary at Huntsville.

Banking and Finance.—The 446 national banks in Texas, according to the report of Oct. 2, 1939, showed a total capital stock of \$75,799,000, plus surplus, profits and reserves of \$76,269,000; deposits, \$1,362,562,000; loans, \$421,879,000; cash reserves, \$672,379,000; total resources, \$1,518,958,000. The 397 State banks on the same date showed a total capital stock of \$16,795,500; deposits, \$193,624,453; loans and discounts, \$79,419,046; total resources, \$235,231,132. The State treasury, for the year ending Aug. 31, 1939, showed receipts from all sources of \$230,594,349. The total disbursements amounted to \$231,884,773. At the end of 1939 a cash balance of nearly \$16,000,000 was announced, despite deficits in three funds amounting to \$25,800,000. The general revenue fund had a deficit of \$21,700,000 and the Confederate pensions and old-age pensions accounts also showed deficits.

Agriculture, Minerals and Manufactures.—Because the drought that set in the year before continued throughout 1939 over most of the State, and because acreage of many crops was reduced, there was a decline in the yield of all important agricultural products. But a general increase in the price level more than offset the loss in quantity, and the total value of Texas crops in 1939 was \$314,765,000, as compared with \$299,394,000 in 1938. The following products declined in both quantity and value: the cotton crop of 2,830,000 bales brought \$121,690,000; cotton seed (1,258,000 tons) brought \$26,670,000; wheat (27,650,000bu.) brought \$17,420,000. The corn crop of 73,376,000bu., though smaller than in 1938, brought \$41,091,000, an increase of nearly \$8,000,000; likewise a reduced yield of grain sorghum (38,115,000bu.) brought \$22,488,000, an increase over 1938 of \$5,000,000. The livestock industries suffered from the drought, but heavy losses were offset to some extent by better prices for bees and lambs. The wool clip for 1939 was estimated at about 76,000,000lb. (or about 20% of the total for the U.S.) and the clip of mohair at 14,000,000lb. (84% of the U.S. total, a virtual monopoly). Prices were generally low.

The petroleum reserves of Texas were estimated (Jan. 1, 1939) at 9,447,764,000bbl., or over 54% of U.S. reserves and over 27% of world reserves. According to latest figures Texas produced about 40% of the U.S. petroleum yield during the year, or over 475,595,000 barrels. In Oct. 1939, there were 88,934 oil wells in the State, and over 200,000 people were employed by the industry. The daily output was over 2,000,000bbl., although the potential output was estimated at 35,000,000 barrels. Production was curtailed by the Texas Railroad Commission by means of proration and the shut-down. At the beginning of 1938 wells were shut down for only 2 days in the week; by Jan. 1940, all wells were shut down for 13 days in the month. The year's production of oil was valued at close to \$500,000,000. The value of the sulphur produced during the year (2,058,940 long tons, or 86% of U.S. production) was

\$37,000,000. The value of natural gas produced in the same period was \$23,000,000.

There was considerable growth in manufacturing during 1939. Employment and payrolls increased. New plants were put into operation, including a large one for making newsprint. Petroleum refining was still the most important of the State's manufactures, with 125 refineries. There was an increase in the number of foundries and plants for the manufacture of carbon black and clothing, and a notable expansion in food producing and processing, especially meat packing and baking. Two of the three large dams for flood prevention and generation of power on the Colorado river were completed during the year. Business conditions varied in different parts of the State, but on the whole showed improvement. (C. W. RA.)

Texas, University of. Dr. Homer Price Rainey was formally installed as president Dec. 9, 1939. On May 5, 1939, McDonald Observatory, the university's astronomical research plant built on Mount Locke in West Texas, by the \$1,000,000 bequest of the late W. J. McDonald, Paris, Texas, capitalist, was dedicated. A bequest of \$2,000,000 from the estate of the late Will C. Hogg of Houston was announced July 15, earmarked for establishment of a distinguished lecture foundation and a State-wide mental hygiene clinic. Teaching personnel for the main university was increased from 460 to 500 for 1939-40. Dr. Americo Castro, formerly professor at the universities of Brazil, Madrid and Wisconsin, and former Spanish ambassador to Germany, was named distinguished professor in Romance languages, Sept. 15, 1939, and E. L. DeGolyer, Dallas oil magnate, was named distinguished professor in geology, effective Feb. 1, 1940. A \$25,000 research institute in pure science and academic fields was established Sept. 1, 1939. A radio research bureau was established Sept. 1, 1939, and on November 19, a \$20,000 radio studio was dedicated. An institute of Latin-American studies was approved by the board of regents to be launched with the 1940 summer school. Enrolment at the main university for the fall semester of 1939 totalled 10,206. Three hundred and seventy-six additional students are enrolled at the Medical school in Galveston, and another 173 are enrolled in the college of nursing there. (H. P. R.)

Textile Industry. War in Europe, which brought the industries of the combatant nations under practically complete state control, brought to the textile industry of the United States in the fall of 1939 a boom which revived nostalgic memories of the "good old days" in textiles. Active, almost feverish, demand set in in most branches of the markets; prices of goods advanced sharply; mill production schedules were extended in an effort to meet the pressure for deliveries. It is true that improvement had set in before the outbreak of the war, and that textile mill activity in the United States during the first three-quarters of 1939 was well ahead of that for the corresponding period of 1938. However, the tempo of demand which developed after war was declared was far different from that which had preceded it. Furthermore, it carried with it an opportunity for a profit, which had been missing from most of the textile business of the first eight months of 1939. Manufacturing margins broadened, and the curse of the textile industry—profitless operation—was removed, temporarily at least. Fortunately, manufacturers confined their sales to a relatively few months ahead, and did not engage in long-time commitments which preceded the debacle of 1937. When the year 1939 closed, the industry was still active with prices relatively firm, but with the outlook for 1940 clouded by the same uncertainties which the world situation imparted to all industry.

Next only to the war as a factor in the economics of the textile industry in the United States during 1939 was the wage-hour law. Effective Oct. 24, 1938, this act had its first full year of operation in 1939. However, its effect was limited by the fact that for many branches of the textile industry specific wage minima were not set and consequently those relatively low mandatory levels in the law itself prevailed. Industry committees for practically all divisions of the industry were organized and got into action, but only the group comprising cotton, rayon and silk, and that covering seamless and full-fashioned hosiery, reached the stage where the administrator actually put into effect recommendations made by the respective industry committees. Of these only the cotton wage created anything like a major disturbance—and that was soon lost in the shuffle of the war boom. For details of this situation *see* COTTON.

Fibres.—From a technological standpoint, there were developments as thrilling, in their own way, as were the war-boom and the wage-hour administration in the economic zone. Outstanding among the technical trends was the production of new synthetic fibres which threatened fundamental changes in textile manufacture. Of these new materials the most highly publicized was Nylon. The popular interest it aroused was due primarily to the fact that it offers a threat to silk in the manufacture of full-fashioned hosiery, which has been silk's almost exclusive domain. Another new synthetic fibre, Vinyon, offers particular competition to cotton in the field of industrial fabrics such as filter cloths, tire fabrics, etc. However, there is a basic change going on which means possibly more than do these specific new materials. Ever increasing use of synthetic fibres cut in short lengths, and known as rayon staple fibre, offers new outlets in practically all branches of the textile industry. For example this cut fibre is now used extensively as a decoration and an adulterant in woollen and worsted goods.

Textile Processes and Machinery.—Machine and process developments have been less spectacular than those in the field of raw materials, but their net result has been the same relentless pressure upon manufacturers to keep alert to change and to adjust their policies to such change before it is too late. In machinery, the outstanding trend has been in the direction of increased mill efficiency made possible by high-speed, automatic machinery and other improved equipment. In processes, the major development in all branches of the industry has been the number of new finishes developed to vary and improve the fabric, and its performance.

Among the specific machine and process developments of 1939 were such advances as: the beginning of the use of paper bobbins on cotton spinning frames, a practice which had already gained considerable headway in Europe, the purpose of which is to eliminate spindle vibration under present high speeds; the development of special drawing, roving and spinning equipment for spun-rayon; the introduction of new looms for weaving spun-rayon mixture suiting fabrics; experimentation with continuous dry-cleaning to replace cloth scouring in the wool manufacturing industry, the purpose being to eliminate one of the most common causes of streaky, cloudy and shady fabrics; and the introduction of resin-pigment printing, similar to the method commonly used for printing on paper. The main objective of the latter method is to produce exceedingly sharp prints.

The net conclusion to be drawn from all of these developments in fibres, machines and processes is that the textile industry promises to be in a continuing state of flux in the years ahead. Any one of these developments might produce radical changes in its branch of the industry; all of them operating together could easily create further radical dislocation among sections of the country, units within the industry and competitive relationships with other industries. (*See also* COTTON; RAYON; WOOL.)

(D. G. Wo.)

Thailand: see SIAM.

Theatre.

The more conspicuous events in connection with the American theatre in 1939 were five in number. The first was the abandonment of the Federal Theatre Project. The second was so great a rebirth of interest in the theatre, both in New York and on the road, that in the later months of the year a theatre shortage threatened in the metropolis, with the result that several dormant playhouses were retrieved from the banks and others who had taken them over during the depression and had found them white elephants. The third was the increased rush of Hollywood motion picture players to get a hearing on the legitimate stage. The fourth was the tendency of the Theatre Guild to rely more and more upon outside producers for plays with which to meet its subscription list and the gradual metamorphosis of a once independent producing organization into something little more than an investing partner and booking agency for other producers. And the fifth was the emergence of young William Saroyan, hitherto known only as a writer of short stories, as the likeliest of the native playwrighting newcomers. In the case of both *My Heart's in the Highlands* and *The Time of Your Life*, he provided ample evidence of a fresh, novel, and estimable dramatic talent.

The Drama Critics' Circle could not agree on an American play for its award, the ballots being split among *The Little Foxes*, *Abe Lincoln in Illinois*, *My Heart's in the Highlands* and *Rocket to the Moon*. The critics' award for the best foreign play to be shown in America went unanimously for the second consecutive time to the Irish Paul Vincent Carroll, on this occasion for *The White Steed*, a study of the older and more tolerant church in conflict with modern bigotry. The Pulitzer prize was given to Robert Sherwood's *Abe Lincoln in Illinois*, that already had achieved a large box-office success, which generally, it seems, is an argument in favour of an award on the part of the Pulitzer committees.

The Mercury Theatre, that began auspiciously under the guidance of Orson Welles, went into the discard, at least temporarily, after a succession of feeble productions, Mr. Welles retiring to Hollywood and the radio. The American Theatre Council, organized several years ago to safeguard the American theatre's best interests and embracing various managers, producers and others associated with the stage, added materially little to its past enterprises, its chief concern, the dispensation of theatre tickets to the public at a fair price and the thwarting of ticket speculation, getting but a small step farther in the direction of a sound solution.

Among other points worthy of note were the following: the great success of the Negro songstress Ethel Waters in her first appearance in a straight dramatic role, in the Heywards' *Mamba's Daughters*; the critical demolition and consequent speedy commercial failure of various plays merchanted solely on the basis of pornography; the continued failure in America of plays which had achieved success abroad but which could not meet the tastes of U.S. audiences; and the failure in turn of the newly instituted American Lyric Theatre (designed to give a hearing to meritorious native composers and librettists in the operetta and musical folk-play fields) to meet satisfactorily its own announced ideals, along with its consequent fall from grace—its two presentations, *The Devil and Daniel Webster*, by Stephen Vincent Benét and Douglas Moore, and *Susanna, Don't You Cry*, by Sara Newmeyer and Clarence Loomis, lasting for only six and four performances respectively.

Still other items to be recorded were the continued activity of the Playwrights Company; the death of Sidney Howard, one of its members; the re-emergence of hypothetically dead vaudeville,



KATHARINE HEPBURN (right) scored her first success on the stage in Mar. 1939 as Tracy Lord in Philip Barry's *Philadelphia Story*

chiefly in connection with theatrical revues but increasingly observable through the eastern and middle-western parts of the country; two swing versions of *The Mikado*, the one professional, the other an offering of the Federal Theatre Project, and simultaneously competing with each other; the belated coming into her acting own of Tallulah Bankhead in *The Little Foxes*; the instantaneous and critically deserved collapse of the One-Act Play Repertory Company, which inaugurated its theatrical program with dire specimens of the art; and Maurice Evans' capital revival of Shakespeare's *Henry IV* (Part 1), with himself in the role of Falstaff.

The best new American plays, from a critical point of view, produced during the year were the aforementioned Saroyan's *My Heart's in the Highlands* and *The Time of Your Life*, and Lillian Hellman's *The Little Foxes*. The most amusing popular comedies were *The Primrose Path*, by Robert Buckner and Walter Hart; *The Man Who Came to Dinner*, by Moss Hart and George S. Kaufman, and a dramatization of the late Clarence Day's *Life with Father*, by Howard Lindsay and Russel Crouse. Indifferent new exhibits that achieved box-office success—it must not be overlooked that most of the worthier plays achieved a similar prosperity—were *Mamba's Daughters*, Philip Barry's *The Philadelphia Story* (on the score of Katharine Hepburn's presence in the cast), S. N. Behrman's *No Time for Comedy* (on the score of Katharine Cornell's ditto), Samson Raphaelson's puny *Skylark*

THE MAN WHO CAME TO DINNER, based on imaginary happenings to Alexander Woolcott, was a successful comedy of 1939 winter season on Broadway



(on the score of Gertrude Lawrence's ditto) and Ben Hecht's and Charles MacArthur's trashy *Ladies and Gentlemen* (even more greatly on the score of Helen Hayes's ditto).

The more prosperous new musical shows and revues of 1939 were *The Streets of Paris*, *Too Many Girls*, and *Du Barry Was a Lady*, with the antecedently produced *Hellzapoppin* and *Pins and Needles* continuing their profitable courses.

Finally, and in conclusion, *Tobacco Road* established an all-time high record run for the New York theatre in passing, by a substantial margin, the record of 2,532 performances previously held by *Abie's Irish Rose*. In the last month of the year, it entered upon the seventh year of its engagement. (G. J. N.)

Europe.—The theatrical work of 1939 was temporarily shattered by the outbreak of war in September. There was, however, one respect in which the international situation did affect the theatre favourably: the need for political reconciliations or strengthening of alliances prompted a natural desire for artistic interchange. So it happened that in the spring of 1939 London had official visits from the players of the Comédie Française and of the National Theatre of Greece, while England, under the auspices of the British Council, sent out the "Old Vic" Company to visit Portugal, Italy, Malta, Athens and Egypt.

The French actors and the Greeks were both established at His Majesty's theatre where the former gave Molière and de Musset with brilliance, while the Greeks presented (in modern Greek) the *Electra* of Sophocles and Shakespeare's *Hamlet*. There was an immense critical ovation for the tragic power displayed by the Greeks in both pieces. The same thing occurred in July when Mr. John Gielgud took a company to play *Hamlet* in English in the courtyard of the castle of Elsinore, by invitation of the Danes. Although the same thing had been done two years before by Mr. Laurence Olivier and the "Old Vic" Company, Mr. Gielgud's production and performance were voted the finer.

It was Mr. Gielgud, too, who gave to a sombre season in London its greatest gaiety. That was a most aromatic revival in period style of Oscar Wilde's *The Importance of Being Earnest* in which he led an all-star cast. This took the fancy of the counties as much as of the capital. When the war broke out and the London theatres were temporarily closed for fear of what might come, nearly all the chief London productions were taken on tour. Mr. Gielgud took out his Wilde production, which was most enthusiastically received in north and south.

The "Old Vic" Company was caught by the war in the middle of its Buxton Festival and never came to London for its autumn season. It toured with success: its novelty was a revival of Goldsmith's *The Good-Natured Man*, a too much neglected classic in whose broad humours Robert Donat made a lively return to the stage from the screen. The Malvern Festival was arranged rather late and provided some disappointments. Its chief feature was the new play by Mr. Bernard Shaw, *In Good King Charles's Golden Days* which turned out to be a historical conversation piece collecting such famous 17th century figures as George Fox the Quaker, Queen Catherine, Nell Gwynn and other ladies of the king's fancy, Sir Godfrey Kneller and Sir Isaac Newton for colloquy on matters of government, philosophy and art with witty, prudent King Charles II and his foolish, turbulent brother James. There was no action in the piece, but it was Shavian palaver of the best. A new Festival was added to the list. In a difficult year the players of Perth made a brave and well rewarded beginning to attract the general attention.

Noel Coward was represented in 1939 by a comparatively old piece, not hitherto acted in England, *Design for Living*, and Benn Levy by *The Mulberry Bush*, a clever but too diffuse pre-war play about the war that came. There was general praise of a fascinating piece about Irish land and Irish peasants, called

Bridge Head, written by Rutherford Mayne. In it that very powerful actor Wilfred Lawson once more demonstrated his power. J. B. Priestley's contribution to the year was a metaphysical fancy about the life after death of an average sensual man, called *Johnson Over Jordan*. Its total merit was disputed, but its intermittent force and beauty were generally conceded. (I. BR.)

Therapeutic Immunization: see SERUM THERAPY.

Third Term: see DEMOCRATIC PARTY; UNITED STATES: *The Third Term Issue*.

"Thirty Dollars Every Thursday": see CALIFORNIA; ELECTIONS.

Thomashefsky, Bores (1868-1939), American Yiddish actor who introduced the Yiddish theatre to the United States, was born at Kiev, Russia on May 12, of parents who were exiled when he was 13 years old. They went to New York city, where Thomashefsky worked in a cigarette factory and, at the early age of 14, arranged for an appearance of a Yiddish acting company from London. After a brief theatrical experience in Chicago, he settled again in New York city, where he began to write plays in Yiddish (nearly 500 in all) and to appear in all sorts of productions from musical comedies to Yiddish translations of Shakespeare. He was sufficiently successful to build his own theatre, the National, on the East side, where he introduced such famous actors as Bertha Kalich (*q.v.*), Joseph Schildkraut, Jacob Ben-Ami and Rebecca Zuckerberg, whom he later married. Thomashefsky continued his appearances on the stage until only a few weeks before his death in New York city on July 9.

Thomson, Sir Basil (1861-1939), British investigator and police official, noted for his consistent success in apprehending German spies in England during the World War, was born on April 21 and was educated at Eton and Oxford. He was for a time prime minister of Tonga in the South Pacific, then returned to England to become an expert penologist. He was assistant commissioner of the London metropolitan police from 1913 to 1919, engaged primarily in combating espionage, and director of intelligence from 1919 to 1921. Among his published works are *South Sea Yarns* (1894), *The Criminal* (1925), *The Story of Scotland Yard* (1935) and several novels. He died in London March 26.

Tibet, a country of central Asia, lying N. and N.E. of the Himalayas, mainly a high tableland. Nominally a Chinese dependency, it is in practice independent. The area is about 450,000 sq.mi.; estimates of the population vary from 750,000 to 6,000,000; 2,000,000 is probably near the truth. The religion is Lamaism and education is carried on by the many monasteries.

At last an authentic reincarnation of the Dalai Lama has been discovered after a three years' search, and has been officially recognized by the Viceroy and Government of India. He is the son of peasants, Lhamo Dhondup, born in Dec. 1933 near Kumbum, a lamasery in the Chinese province of Kansu some 50mi. east of Lake Koko Nor, and was found living in a cave. Proof of his identity was furnished by various miracles, and after a journey of nearly three months he was welcomed in Lhasa with great rejoicing and full ceremonial ritual on October 8.

The acceptance by the Tibetans of Lhamo Dhondup (who later became Lingerh Lamutanchu), as well as the actual journey, was strongly forwarded by the Chinese authorities, and it is probable that another effort will now be made to reassert Chinese influence over Tibet which, owing to Tibetan resistance, has waned in recent



LINGERH LAMUTANCHU, a Chinese boy, was chosen 14th Dalai Lama of Tibet in 1939. He was born Dec., 1933.

years. The future of the country, and of its ruler, is, however, uncertain; the former because there is a powerful Nationalist party working towards the transformation of Tibet into a modern state, and the latter because in the past Dalai Lamas—the 13th, who lived to a good age, being an exception—have usually died mysteriously before reaching manhood.

During the year 1939 German and Italian scientific expeditions visited the country, and much valuable geographical research work was carried out; the Germans also claim to have discovered the "shape," an animal allied to the Himalayan wild goat, the tahr, and hitherto met with only in Tibetan folklore.

In September, gambling, the use of tobacco, and "chang," a very potent native drink, were forbidden; the latter ban being imposed principally in the interests of the conservation of barley.

Timber: *see* LUMBER.

Tin. In 1938 world tin production decreased 29% from 1937 and 23% below the high point of 1929, to 148,700 long tons. All of the major producing countries showed material decreases with the exception of Bolivia and China; most of the intermediate producers, with outputs of 1,000–10,000 tons, likewise shared in the decrease, but some of these as well as of the minor producers showed a little improvement. Production to the end of Aug. 1939 totalled 87,000 tons, but war demand probably increased the output of the remaining four months to about the same amount. The accompanying table gives the details of output for the leading producers, accounting for about 90% of the current total.

British Empire production of tin covers nearly one-half of the

World Production of Tin
(Long tons)

	1929	1933	1936	1937	1938
Belgian Congo . .	1,000	2,200	7,300	8,900	7,300
Bolivia	43,300	14,700	24,100	25,100	25,400
China	6,800	9,500	10,700	10,500	11,200
Dutch E. Indies . .	35,200	12,600	31,600	39,800	21,000
Malaya	69,400	24,900	66,800	77,500	43,200
Nigeria	10,700	3,800	9,600	10,500	7,300
Siam	10,500	10,300	12,700	16,500	13,500
World total . . .	193,000	91,000	180,000	208,000	148,700

world total, but in Great Britain itself the output is only about 2,000 tons annually; aside from the main sources in Malaya and Nigeria, other British territory in Africa produces about 1,600 tons, Australia 3,300 tons, and Burma 4,000 tons.

Although the United States has no appreciable tin output, the country is the world's largest consumer, having during the past 25 years imported amounts averaging 46% of the world output, and in addition has supplemented these imports with secondary tin recovered from previous use, to the extent of 35% of the amount of new metal used. In 1938, imports declined sharply from the record level of 88,000 tons in 1937, the total being 49,700 tons, increasing to 49,800 tons for the first 10 months of 1939.

In order to avoid adverse effects on the world market, the British Ministry of Supply removed all price restrictions in an order effective December 11; about the same time export quotas for the first quarter of 1940 were raised to 120% of the standard tonnage (208,940); during 1939 the quotas were: first quarter 35%; second quarter 40%; third quarter 120%; fourth quarter 100%.

In November it was announced that the Phelps Dodge Refining Corporation and the American Metal Company were building plants in the New York area for the treatment of Bolivian ores, diverted from European smelters now in the war zone. (*See also* MINERAL AND METAL PRICES AND PRODUCTION.) (G. A. Ro.)

Tiso, Josef (1887–), Slovakian politician and ecclesiastic. He was ordained a Roman Catholic priest in 1909 and after the end of the World War became engaged in Slovakian nationalist politics under Andreus Hlinka. After Father Hlinka's death Aug. 16, 1938, Tiso became leader of the Slovak People's party.

When Czecho-Slovakia granted the Slovaks their long-desired autonomy in Oct. 1938 after the pact of Munich, Tiso became prime minister and chief delegate to the Komarom conference which redefined the Hungarian-Slovakian frontier. On March 10, 1939 Tiso was suddenly ousted by the Czech Government; he appealed to Hitler for assistance and four days later Slovakia proclaimed its independence. Tiso was reinstated as prime minister, and on March 23 Slovakia signed a treaty by which Germany guaranteed its political integrity for 25 years, at the same moment that Hungarians were invading its eastern frontier. On August 18 Germany assumed military control over Slovakia, and 12 days later Tiso proclaimed German military rule. On October 26 Tiso was elected first president of the Slovak republic. (*See also* SLOVAKIA.)

Titanium. Both ilmenite and rutile are utilized as sources of titanium, although the former furnished most of the supply; rutile is probably mined not to exceed 1,000 tons a year, while the figure for ilmenite has grown to something like 275,000 tons. India and Norway are the chief producers, with small amounts from Senegal, Canada, Portugal, Brazil, and Egypt. Although some titanium is used as an alloying agent in steel, the

great expansion in demand that has come during the past few years resulted from the development of titanium pigments for paint and ceramic work. Imports of titanium ores into the United States in 1938 totalled 201,500 short tons, as compared with 43,300 tons in 1933. (G. A. Ro.)

Tobacco. The United States tobacco crop of 1939 was estimated by the Department of Agriculture November 1 as the largest on record, 1,659,409,000lb., slightly larger than the previous record of 1930 and comparable to a 1938 crop of 1,378,534,000 pounds. The yield was also a record, 920.6lb. to the acre as against 860.1lb. in 1938 and the previous highest yield, 902.6lb. in 1935. Offsetting this bumper production, however, were the narrowing wartime market restrictions. In April, Great Britain increased the import duty on leaf tobacco by two shillings a pound and on September 28 a second advance of two shillings (about 40¢) was added to all tobacco imported into the United Kingdom either from foreign countries or Empire sources. This made the British import on United States leaf 13s., 6d. a pound (about \$2.70). Or, about 14¢ on a package of 20 cigarettes, comparable to the six cents of the U.S. internal revenue tax. Most other large producing countries had smaller crops in 1939 than in 1938. In Canada the official estimate September 1 was 94,664,000lb. as against 98,340,000lb. despite an acreage increase of 67,408ac. in 1939 compared to 63,130ac. in 1938. Of the 1939 crop about 69,000,000lb. was flue-cured, compared to 75,145,200lb. in 1938. In China consular reports placed the 1939 crop at 115,000,000lb., a substantial decline from 1938. Difficulty in obtaining coal prevented flue-curing of a large part of the crop. In territory controlled by Japan sale of British tobacco products was prohibited and effort was made to keep the trade in Japanese hands, the Japanese putting into operation at Kalgan a new cigarette factory with a capacity of 800,000,000 cigarettes a year. The tobacco crop in the Japanese Empire was estimated at 98,535,000 pounds. Preliminary estimates of the Manchurian crop were 25,000,000lb. approximately double 1938 production. Wet weather and low temperatures reduced production from 17,931,000lb. in 1938 to 12,700,000lb. in 1939 in Nyasaland, the principal tobacco producer of East African colonies and the United Kingdom's oldest colonial source of tobacco. In Australia the 1938-39 crop was 3,922,000lb. compared to 5,980,000lb. the preceding year.

In the United States 1939 production of flue-cured tobacco was estimated at 1,019,510,000 pounds. The flue-cured crop was 785,731,000lb. in 1934. The ten-year average (1928-37) was 704,802,000 pounds. Fire-cured tobacco in 1939 was estimated at 96,146,000lb., and 84,324,000lb. in 1938. The 1939 crop was about 31% under the ten-year average. Dark air-cured types of tobacco were 36,927,000lb. in 1939, and 32,789,000lb. in 1938, the ten-year average being 44,494,000 pounds. Burley tobacco production was estimated at 350,669,000lb. compared to 338,789,000lb. in 1938 and a ten-year average of 315,689,000 pounds. In November, 89,123 burley growers voted for and 17,710 voted against Agricultural Adjustment Administration quota control of the 1940 burley crop. About half the burley growers voted.

Tobacco Production (All Types) by States, 1938 and 1939

	1939 lb.	1938 lb.		1939 lb.	1938 lb.
North Carolina	606,525,000	516,850,000	Connecticut	25,224,000	16,223,000
Kentucky	313,646,000	292,175,000	Florida	22,335,000	19,684,000
Virginia	130,198,000	98,906,000	Massachusetts	9,881,000	6,786,000
South Carolina	118,750,000	98,800,000	Indiana	9,704,000	9,583,000
Tennessee	97,999,000	98,905,000	Missouri	5,655,000	6,175,000
Georgia	96,920,000	90,950,000	West Virginia	2,025,000	2,208,000
Pennsylvania	36,085,000	32,110,000	New York	2,025,000	1,680,000
Wisconsin	32,810,000	32,710,000	Minnesota	810,000	770,000
Maryland	29,562,000	29,250,000	Kansas	505,000	475,000
Ohio	28,160,000	23,885,000	Alabama	490,000	409,000

(S. O. R.)

Tobago: see WEST INDIES, BRITISH.

Todd, David (1855-1939), American astronomer, was born at Lake Ridge, N.Y., on March 19. He took his bachelor's and master's degrees at Amherst college and his doctorate at Washington and Jefferson college in 1888. While still a graduate student at Amherst he was appointed to the U.S. Transit of Venus commission and was chief of the U.S. Naval observatory eclipse parties in Texas in 1878. From 1881 to 1920, when he retired, he was professor of astronomy and navigation and director of the observatory at Amherst. The year after this appointment he was invited by Lick observatory to take charge of observations of the transit of Venus. He led eclipse expeditions to Japan, Tripoli, the Dutch East Indies, Russia and South America and was the first man to take an aerial photograph of the solar corona during eclipse, at Mitchel Field, L.I., in 1925. Among the best known of his many astronomical photographs were those of Mars taken from a temporary observatory 16,000ft. up in the Andes of Northern Chile in 1907. Todd died at Madison Heights, Va., on June 1.

Togoland: see BRITISH WEST AFRICA.

Tokyo, capital of Japan, population (1937) 6,274,000; area 257 sq.mi., situated at 35° 41' N. and 139° 45' E. at the head of the bay of the same name on the south-east coast of Honshu, the main island of Japan.

Tokyo is served by an extensive system of tramcars, buses and city railways. A subway is under construction and the part which has already been completed serves a section of the central districts of the city. A further section was opened for traffic in the autumn of 1938. It is a self-governing municipality, governed by an elected common council and board of aldermen. A good deal of executive authority is vested in the mayor, who is elected by the common council. As the capital of the empire, Tokyo is the place of residence of a large number of Government officials and civil servants. It is also Japan's largest educational centre, the Kanda Ward being largely a students' quarter. As of March 1, 1935, Tokyo had 22 universities, with 46,625 students and 72 professional schools, with 52,165 students. Tokyo and its environs rank as one of Japan's four great industrial regions, the others being Osaka, Nagoya and North Kyushu. At the end of 1936 there were in Tokyo 13,326 factories, employing more than five operatives, with 329,439 workers. There were 29,544 small workshops, employing less than five persons, with 47,279 workers. A feature of Tokyo is the extremely large number of small shops of all kinds. There were 164,438 of these at the end of 1936. (W. H. CH.)

Toller, Ernst (1893-1939), German dramatist, was born in Samotschin, Prussia, of a Jewish family on December 1. He served for a while in Flanders with an artillery regiment during the World War but was invalided out of the army and returned home. For his part in the Munich revolution of 1919 he was imprisoned in a fortress for five years, during which time he wrote many of his most famous works, including *Masse-Mensch* (1921, translated into English in 1923), a revolutionary drama smuggled out of Germany and presented by the Theatre Guild in New York city as *Man and the Masses*. His last play, *Pastor Hall*, was published only a few weeks before his suicide May 22, 1939, in New York city, where he had resided in exile. For a description of his other works, see *Encyclopædia Britannica*, vol. 22, p. 272.

Tomatoes. Production of tomatoes for commercial processing in 1939 in the United States was 1,925,500

short tons, compared to 1,742,600 short tons in 1938 and a ten-year (1928-37) average of 1,458,000 short tons. The acreage of tomatoes harvested for processing was 347,020 in 1939, and 392,350 in 1938, with a ten-year average of 356,980 acres. Prices for tomatoes for processing averaged \$12.30 per ton in 1939. In 1938 it was \$12.41 per ton. The average price for the ten-year period was \$12.72. Production of commercial tomatoes in the United States for fresh marketing was 24,585,000bu. in 1939 compared to 24,724,000bu. in 1938, and a ten-year (1928-37) average of 18,707,000 bushels. The acreage of the crop for fresh marketing was 210,450 in 1939 compared to 218,700 in 1938 and a ten-year average of 169,660 acres. Production of tomatoes:

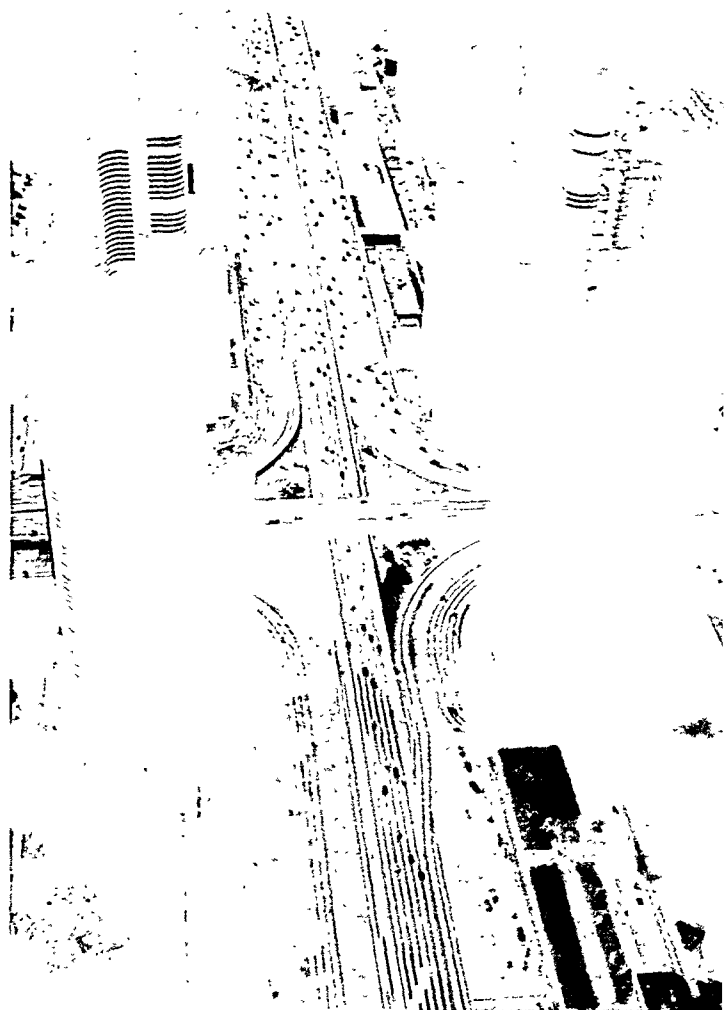
	1939	1938	Average 1928-37
Fall	556,000bu.	350,000bu.	356,000bu.
Early (1)	2,880,000bu.	2,945,000bu.	1,448,000bu.
Early (2)	3,713,000bu.	3,502,000bu.	2,048,000bu.
Second Early	3,504,000bu.	4,193,000bu.	3,528,000bu.
Intermediate	6,667,000bu.	6,350,000bu.	5,976,000bu.
Late (1)	6,293,000bu.	5,774,000bu.	4,744,000bu.
Late (2)	912,000bu.	1,550,000bu.	907,000bu.
			(S. O. R.)

Tongan Island Protectorate: *see* PACIFIC ISLANDS, BRITISH.
Tongking: *see* FRENCH COLONIAL EMPIRE.
Tor Der Welt: *see* BRIDGES.

Toronto, with a population of 647,803 (1938) and an area of 34 sq.mi., is the second largest city of Canada and capital of the Province of Ontario. It is greatly concerned in the industries of manufacturing and mining and in the distribution of goods, and for the last-named purpose is advantageously situated on the line dividing the population of Canada as between East and West. Communications by land, water and air are good. The University of Toronto, with some 7,500 students, is said to be the largest university in the British Empire and has become world famous in teaching, in research, and in the advancement of science. The corporation of the city of Toronto owns the street railway and motor bus transportation, the waterworks system, and the local hydro-electric system which has exclusive distribution of electricity for light, heat and power. The Canadian National Exhibition, now in its 62nd year, is a great annual event attracting 1,650,000 visitors in 1939. The well-known Royal Winter Fair, with its agricultural, livestock and horse show, held annually, grows steadily in importance. Toronto, in common with the rest of Canada, welcomed the visit in the summer of 1939 of Their Majesties, the King and the Queen. (G. R. G.)

Torpedoes: *see* SUBMARINE WARFARE.
Torts: *see* LAW (CASE): *Torts*.
Totalitarian State: *see* EDUCATION; EDUCATION, SECONDARY; EUROPEAN WAR; GERMANY; ITALY; SPAIN; UNION OF SOVIET SOCIALIST REPUBLICS.
Touring and Tourist Camps: *see* TRAILER TRAVEL.

Town and City Planning. The International Congress for Housing and Town Planning was held in July of 1939 in Stockholm, Sweden. Housing projects were carried on in most of the larger countries of Europe and America, in some places making a maximum use of planning and in others ignoring regional planning problems and making scanty use of modern planning lay-out. Great Britain announced the 4,000,000th house built since the World War and the total clearance, under slum reclamation, of 236,000 houses, reflecting a displacement of nearly 1,000,000 persons. The English public housing projects generally received the benefit of expert planning. In the United States an extensive public housing program was authorized by the newly created U.S. Housing Authority, under the Act of 1937 which supplemented previous housing projects



THE CITY OF 1960, as envisaged in a General Motors exhibit at the New York World's Fair in 1939, will have widely spaced skyscrapers of 150 stories, double-decked streets, and parks on the roofs of low buildings

under the Public Works Administration and the Department of Agriculture.

Planning restudies of metropolitan and rural areas were under way in Great Britain in the Lake district, Yorkshire, and Sussex. Birmingham was the first of the English cities to provide parking and air-raid shelter, but the exigencies of war have made this necessary in all exposed English cities. The English Camps Act of 1939 authorized the construction of permanent camps to be used by schools in peacetime and available for evacuation in wartime. In Paris, before the war, progress was made on a plan for the development of rural areas in the metropolitan district, to be integrated with the city plan.

In Germany plans were made to develop Nuremberg as a political centre and to preserve the amenities of the old town. Revised street plans were under way in Hamburg, where a five-year plan involved street widenings and the provision of several thousand parking places, and in Brussels, where the north and south railway stations are being connected by an underground tunnel, with subterranean garages over the tunnel. Comprehensive replanning of Naples and Milan has been undertaken.

There was great activity in the United States to revise planning and zoning laws from 10 to 20 years old. The New York City Planning Commission, authorized in the city charter, adopted in 1937, and given more definite duties and powers than in most American cities, issued a bulletin on major reports of the commission. By official ordinance Chicago set up a planning commission of 22 members with an advisory board of 200. New York appropriations for the planning commission are in a class by themselves, but a study of appropriations in 1938-39 for city planning commissions in the 17 cities of the United States with 500,000 population or over, showed that 15 made budget provision of \$10,000 to

\$50,000; of the 25 cities from 200,000 to 500,000, 12 appropriated \$5,000 to \$13,000; but there was a rapid falling off in appropriations for the smaller cities. Many made no appropriations at all.

There is indication that many of the countries are paying increased attention to the conservation of their natural scenery, as witnessed by the plans in Copenhagen, based on the Danish town planning law of 1938, with due regard for the law for preservation of nature passed in 1937. Many countries are building super-highways to connect principal cities. In Denmark a diagonal highway is being built from the interior to the port of Esbjerg-Harwich steamship line, providing an important transport link with England; in U.S.S.R. a fine new road is being built from Moscow to Minsk of which some 400 mi. were put into use in 1939; in Poland, the first motor road was projected from Warsaw to Lodz, but the war has no doubt thwarted that plan; in Japan, the ministry of the Interior has decided to build a 600-mi. motor road, after the German pattern, from Tokyo to Fukuoka, to pass through a submarine tunnel at Kamoun, under construction in 1939. There is under construction a new international highway over the St. Lawrence between Canada and the U.S., with nine miles of bridges built to avoid interference with shipping. In the United States, Great Britain, France, Germany and other countries, where excellent highway systems have been developed, roads were improved, shortened and re-routed. In the United States there was completed and put into use one-third of the 500-mi. Blue Ridge parkway connecting Shenandoah and Great Smoky Mountains National parks. Plans progressed on the Natchez Trace parkway which will connect Nashville with Natchez. These, with the George Washington Memorial parkway from Mt. Vernon to Great Falls in the Washington metropolitan region, including the completed section from Washington to Mt. Vernon, will provide three Federal parkways aggregating nearly 1,000 miles. Following the pattern set by Westchester county, N.Y., the opening in 1939 of the Merritt parkway in Connecticut, used in connection with the Saw Mill parkway, and the Hendrik Hudson parkway running along the river the full length of New York city, provided direct through motor dispatch from New England to the South.

In the United States the two World Fairs—one at San Francisco and one at New York city—made distinct contributions to planning in their own construction. In addition, at the New York Fair, General Motors presented Futurama, a bold conception of the city of the future, as planned by Norman Bel Geddes. At the New York Fair, too, the American Institute of Planners presented the moving picture of "The City," financed by the Carnegie Corporation. (See also HOUSING; ROADS AND HIGHWAYS.)

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Trachoma: see EYE, DISEASES OF; INDIANS, AMERICAN.

Track and Field Sports. The Olympic Games, scheduled to be held in Helsinki in 1940,

have been cancelled because of the European war.

Not only in Finland, with Taisto Maki breaking five world records, surpassing the exploits of Paavo Nurmi, but also in England and in Germany native athletes made assaults on world records, as did American athletes on tour abroad in the summer of 1939. Next to Maki in achievements was Sydney Wooderson, the small London bank clerk who created a new world record for the three-quarter-mile run and established a new British record in the one-mile run, the fastest run last year in any stadium. Rudolf Harbig, a Nazi middle distance star, bettered two world records, and Lutz, another Nazi, broke the world hammer mark. An American 3,200-metre relay team set up a new world mark, and Chuck Fenske (U.S.A.) accounted for a new world mark for the 1,000-yd. run, an odd distance not recognized by the International Federation. As indoor performances are not acceptable by the Federation, the new world (U.S.A.) marks set up by John Borican in three races, the Fordham one-mile relay record, and the pole vault of Cornelius Warmerdam, will stand as a matter of recording only. Glenn Cunningham was America's one-mile ace indoors for the eighth year.

To Maki, the Mercury-winged Finn, go laurels for slashing the two-mile record 2-8sec., to 8min. 53-2sec.; three miles in 13min. 32-4sec.; 5,000 metres in 14min. 8-8sec.; six miles in 28min. 55-6sec.; and 10,000 metres in 29min. 52-2sec., thereby clipping from 8-2 to 13-2sec. from records made by Olympic champions.

Wooderson's new British mile record in 4min. 7-4sec. was followed by new world record time of 2min. 59-5sec. for the three-quarters. Ten days later he attempted to reduce the mile world record in Princeton, N.J., in a race that jarred the athletic world because of the unavoidable crowding by Blaine Rideout. Wooderson was forced to cut short one stride, which made little or no difference to the outcome of the race. Sports authorities are of the opinion that his slow pace up to that time prevented a new world record and favoured his American rivals to win in the rush to the finish line, which they did, in the off-record time of 4min. 11sec., won by Chuck Fenske, of Wisconsin. Cunningham took second, San Romani was third, Rideout ran fourth, and Wooderson fifth and last of the field.

Wooderson had not lost a race abroad in three years and had broken four world records in 22 months.

Harbig's records are dazzling because he covered 400 metres in 46sec., and ran 800 metres in 1min. 46-6sec., three full seconds faster than the previous record of Elroy Robinson (U.S.A.). Lutz, the Nazi hammer thrower, earned his world record by a heave of 193ft. 9½in., bettering the mark of Paddy Ryan, made in 1913, by more than four feet. The indoor "rejects" by the Federation are Fenske's new world time of 2min. 9-3sec. for 1,000yd.; John Borican's indoor marks of 800 metres in 1min. 49-2sec., 880yd. in 1min. 49-8sec., and 1,000yd. in 2min. 8-8sec.; the Fordham one-mile relay time of 3min. 15-2sec., and the pole vault mark of 14 ft. 6½in. by Cornelius Warmerdam.

In a survey by the Amateur Athletic Union, the summary shows Americans as winning the "Paper Olympics of 1939." The athletes of the United States outscored the others with 209 points, 108 for Finland, 74 for Germany, 28 for Norway, and so on.

The American A.A.U. outdoor championships at Lincoln, Neb., uncovered many unexpected upsets, with 11 of 18 of the former champions dethroned, including the New York A.C. as team winner, bowing to the Olympic Club of San Francisco. Blaine Rideout got away to a long lead in the 1,500 metres and won from Glenn Cunningham, Fenske and San Romani, in that order. Fred Wolcott, of Rice university, ran the 200-metre hurdle race around a turn in 22-9sec.; J. Gregory Rice, of Notre Dame, smashed the 5,000-metre meet record in 14min. 50-9sec.; Phil Fox, of Olympic Club, sent the discus 172ft. 4½in., the best by an American; the

N.Y.A.C. 400-metre relay team broke the meet record in 41 seconds. With a helping wind, Clyde Jeffrey, of Olympic Club, equalled Jesse Owens's world record of 10.2sec. for 100 metres, and that time was equalled by Jeffrey Ellerbe, of Tuskegee; Herbert Thompson, of Jersey City, and Norwood Ewell, of Penn State, did 10.3sec., bettering the meet standard of 10.4, but these four under-par marks were disallowed. Fred Wolcott and Joe Batiste won in the 110-metre high hurdles event, in 13.8 and 14.1sec., respectively, both under the record of 14.2, but were also denied the new marks because of the wind.

The national A.A.U. decathlon championship, a supreme test in 10 events, was won by Joe Scott, of Western Reserve, by a wide margin, and the national pentathlon title, for a five-event contest, was won by John Borican against a fast field. In short-distance walking events the performances were below standard; in longer distances, John Rahkonen, a Finn, was a triple winner, leading in the 15,000, 30,000 and 40,000 metres events; Albert Cicerone led in the 20,000 metres walk, and Ernie Crosby won the 50,000 metres walk (31½mi.), the Olympic distance, in 5hr. 19min. 33.3sec., about 49½min. behind the Olympic record of Whitlock, of England, in the 1936 Olympics.

Indoors, track and field sports attracted large audiences in New York, Chicago, Boston, and other cities. Five new meet records were established and one citizen record reduced in the A.A.U. championships in Madison Square Garden, New York. Herbert Thompson equalled the 60-metre record of 6.6sec.; the new records were Alan Tolmich's 65-metre hurdle race in 8.4sec.; Don Lash's 5,000 metres in 14min. 30.9sec.; the 1,600-metre relay in 3min. 17.2sec., by the 69th Regiment team; the 2,900-metre relay record of 7min. 8.3sec., by the New York A.C. team. The N.Y.A.C. also retained its team title in the 16-event program.

The two major collegiate track fixtures, the Penn Relays and the Drake Relays, held at Philadelphia and Des Moines, respectively, brought out many future Olympians. At Philadelphia foot racers of Pitt flashed to two breath-taking finishes in winning the 440-yd. relay and the one-mile relay—first beating Cornell in 42.3sec. in a dazzling blanket finish, and then when John Woodruff, rangy Negro, ran the half-mile anchor leg in 1min. 51.2sec. to mow down the N.Y.U. and Fordham teams. North Texas State retained its distance medley title in the 2½-mi. event.

Spectators at the Drake Relays saw record-breaking performances during the big two-day carnival that brought a field of 2,000 athletes from the entire U.S. The crack sprint relay team of Rice Institute lowered the meet record by covering the mile in 3min. 25.1 seconds. Rice athletes equalled the 440-yd. relay record in 41.5 seconds.

Europe.—Track and field sports on the Continent went forward with characteristic progress until the outbreak of the European war in September. In England, running and the name of Sydney Wooderson are synonymous. From the beginning of the season all indications pointed to a new world record in the one-mile event, particularly after Wooderson turned in his 4min. 7.4sec. mile on Whit Monday, and covered the three-quarters in the fastest time that man has ever run the distance, in 2min. 59.5 seconds. (This is the first time that anyone has ever been clocked under three minutes, the new time being 8/10sec. under the 3min. 0.3sec. record of Rideout, of North Texas college, U.S.A.)

In the International Meet in London against 15 nations, a team of 10 American athletes carried off major honours, winning eight first places in the 14 events. Roy Cochran (U.S.A.) won the 440-yd. hurdles in 52.7sec., a new British record. Clyde Jeffrey (U.S.A.) won both the 100- and 220-yd. dashes. Bill Watson (U.S.A.) was the high point scorer, breaking the English shot put record, with 52ft. 8in., winning the broad jump with a leap of

24ft. 6 in., and scoring third in the discus. Charles Beetham tied the British record of 2min. 11sec. for the 1,000-yd. race, in Glasgow.

In Paris the American track team defeated a favoured French team in the two-mile relay, establishing a new world record of 7min. 35.2 seconds. Fifty new records, among them three world records, were chalked up for Germany's athletes during 1939. Harbig's 400- and 800-metres records, and Christel Schulz's long jump of 6 metres 12 centimetres are the three world records.

World's Best Track and Field Performances of 1939

100 Yards	10,000 Metres
9.5 sec.—Greer, United States	29 min. 52.3 sec.—Maki, Finland (World Record)
9.5—Ellerbe, United States	30:07.6—Tuominen, Finland
9.5—M. Robinson, United States	30:10.6—Pekuri, Finland
9.5—Dunn, Australia	30:10.6—Salminen, Finland
9.6—Jeffrey, United States; Hill, U.S.; W. Miller, U.S.; Brown, U.S.; Witcher, U.S.; Lewis, U.S.; Chabat, U.S.; Nelson, U.S.; Allen, U.S.; Lindstrom, U.S.; Thompson, U.S.; Peacock, U.S.; Ewell, U.S.	30:37.6—Tillman, Sweden; Csaplari, Hungary
100 Metres	110-Metre Hurdles
10.2 sec.—Jeffrey, United States	14.1 sec.—Wolcott, United States
10.2—Ellerbe, United States	14.2—Batiste, United States
10.3—Neckerman, Germany	14.2—Farmer, United States
10.3—Thompson, United States	14.2—Gedeon, United States
10.3—Scheuring, Germany; Ewell, U.S.	14.2—Lidman, Sweden
200 Metres	400-Metre Hurdles
20.7 sec.—Jeffrey, United States	51.6 sec.—Hoelling, Germany
20.8—Lewis, United States	51.9—Cochran, United States
20.9—Ledford, United States	52.0—Glaw, Germany
21.0—Morris, United States	52.8—Borican, United States
21.0—W. Miller, United States; Davis, U.S.; Ewell, U.S.; Scheuring, Germany	53.2—Virta, Finland
400 Metres	High Jump
46.0 sec.—Harbig, Germany (World Record)	6 ft. 8½ in.—Steers, United States
46.7—Lanzi, Italy	6:7½—Tanaka, Japan
46.8—Woodruff, United States	6.7—Wilson, United States
47.1—Belcher, United States	6.7—Devall, United States
47.2—E. Miller, United States; Quigley, U.S.; Briedenbach, U.S.	6.7—M. Walker, United States; Stewart, U.S.; Albritton, U.S.
800 Metres	Broad Jump
1 min. 46.6 sec.—Harbig, Germany (World Record)	25 ft. 8½ in.—Kin, Japan
1:49.0—Lanzi, Italy	25.5½—Watson, United States
1:50.3—Brandscheit, Germany	25.5½—Lacefield, United States
1:51.1—Beetham, United States	25.4¾—Brown, United States
1:51.2—Woodruff, United States; Giesen, Germany; Schumacher, Germany	25.1½—Gordon, United States
1,500 Metres	Pole Vault
3 min. 48.8 sec.—Andersson, Sweden	14 ft. 7 in.—Meadows, United States
3:49.2—Jonsson, Sweden	14.5½—Warmerdam, United States
3:50.0—Hartikka, Finland	14.5—Day, United States
3:50.2—Pell, Great Britain	14.5—Ganslen, United States
3:50.2—Kaindl, Germany	14.4—Varoff, United States; Hansen, U.S.
One Mile	Hop, Step and Jump
4 min. 07.4 sec.—Wooderson, Great Britain	51 ft. 10½ in.—Strom, Norway
4:10.4—Mostert, Belgium	51.6¾—Miller, Australia
4:10.7—Cunningham, United States	50.11—Rajasaari, Finland
4:11.0—Fenske, United States	50.9—Kin, Japan
4:11.2—Zamperini, United States	50.6—Bringas, Peru
Two Miles	Discus
8 min. 53.2 sec.—Maki, Finland (World Record)	172 ft. 4½ in.—Fox, United States
8:53.5—Tuominen, Finland	171.5½—Lampert, Germany
8:54.8—Pekuri, Finland	169.11¾—Sorlie, Norway
8:57.8—Jarvinen, Finland	169.0¾—Wotaepck, Germany
9:00.9—Salminen, Finland; Sarkama, Finland	168.2½—Zagar, United States
Three Miles	Shot
13 min. 42.4 sec.—Maki, Finland (World Record)	55 ft. 11 in.—Hackney, United States
Six Miles	54.6½—Watson, United States
28 min. 55.6 sec.—Maki, Finland (World Record)	54.1¾—Stoeck, Germany
3,200 Metres Relay	53.11¾—Williams, United States
7 min. 35.2 sec.—U.S. (Schwartzkopf, Cochran, B. Rideout, Beetham)	53.11¾—Woelcke, Germany
5,000 Metres	Javelin
14 min. 08.8 sec.—Maki, Finland (World Record)	250 ft. 11 in.—M. Jarvinen, Finland
14:16.2—Pekuri, Finland	250.6¾—Autonen, Finland
14:18.8—Jonsson, Sweden	244.11¾—Nikkanen, Finland
14:22.0—Salminen, Finland	241.2—Sule, Estonia
14:24.2—Kusocinski, Poland	237.4¾—Atterwall, Sweden
	Hammer
	193 ft. 9½ in.—Lutz, Germany (World Record)
	192.5¾—Veirila, Finland
	192.5—Blask, Germany
	192.2¾—Storch, Germany
	187.1¾—Hein, Germany
	183.5¾—S. Mayr, Germany

(J. B. P.)

Trackless Trolleys: see ELECTRIC TRANSPORTATION.

Tractors: see FARM MACHINERY.

Trade Agreements. During 1939, U.S. trade agreements were signed with Turkey (April 1) and Venezuela (Nov. 6) bringing to 22 the number of agreements signed under the authority of the Trade Agreements Act of 1934 (not including two supplemental agreements with Canada and Cuba). The most important agreement, both by reason of the

value of trade involved and by reason of its telling influence upon the commercial policies of the great trading nations of the world, is the agreement between the United States and the United Kingdom, signed on Nov. 17, 1938. On the same day was signed a second trade agreement with Canada.

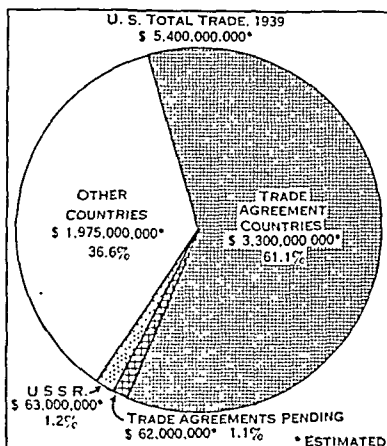
The United States commerce with the British Empire constitutes roughly about a third of its total foreign trade. The United Kingdom is the United States' largest customer. In 1929 the U.S. sold to the United Kingdom goods valued at \$848,000,000; in 1938 the value of the exports had dropped to \$521,000,000. American farmers have a particularly vital stake in English markets, for approximately a third of the total agricultural exports are sold in the United Kingdom.

After the United Kingdom, Canada buys more goods from the United States than any other country. Taken together, the concessions embodied in the two agreements cover more than 3,000 tariff items. The U.S.'s total exports to and imports from the areas concerned amounted in 1937 to \$2,025,322,000. Of this total, 68%, or \$1,377,422,000 worth of trade, is covered by the concessions given and received. The exports and imports of the areas included in the agreement between the United States, United Kingdom and Canada account for over a third of the total international trade of the world. Both the United Kingdom and Canada in these agreements have notably modified their policies of protection and preference, and have joined with the United States in a policy of trade liberalization.

In view of the fact that the trade of the United States and of the areas now covered by U.S. trade agreements constitute more than 60% of the foreign trade of the world, it is evident that the American program, built upon the sound principle of lowered trade barriers and non-discrimination, and designed to counter the crippling and provocative trade practices which followed the economic crash of 1929, is proving practical and effective.

The U.S. trade agreements program grew out of the conditions and needs resulting from the world depression following 1929. Nations had entered into feverish competition with each other to sell to foreigners a maximum and to buy from foreigners a minimum of goods. Trade barriers had been built up to unprecedented heights. To constantly mounting tariff walls were added entirely new economic devices for regulating trade—quota restrictions, exchange controls, Government trade monopolies and export and import licensing requirements. The trade highways of the world became blocked with impassable barriers. International trade fell to a third of its 1929 value. From 1929 to 1933 the value of U.S. foreign trade fell from \$9,640,000,000 to only \$3,125,000,000. The resulting economic and social dislocation was the cause of widespread suffering and increasing national problems.

To meet this national emergency, legislation designed to increase U.S. foreign trade was worked out upon the basis of three principles of tariff making, each of which had been separately adopted heretofore in U.S. legislation, but which in combination were entirely new. The three principles are these: (1) Congressional delegation to the President of the power of tariff adjustment within prescribed limits. (2) Tariff negotiation by



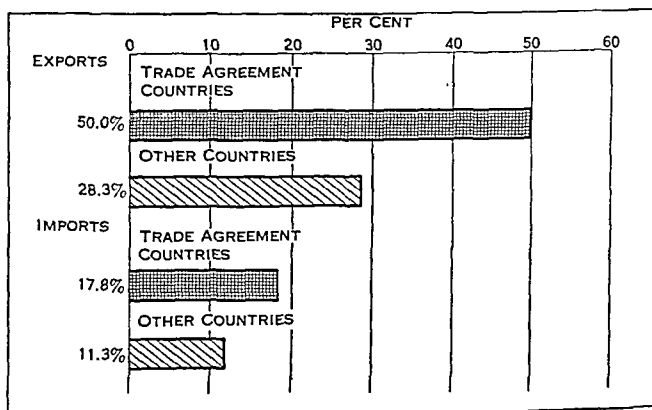
executive agreement. (3) Generalization of all tariff reductions (except those granted to Cuba) to the products of all countries which do not discriminate against American commerce.

The Trade Agreements Act, signed on June 12, 1934, offered a new program based upon these three accepted principles. The act authorized the President "for the purpose of expanding foreign markets for the products of the United States" (1) "to enter into foreign trade agreements" and (2) "to proclaim such modifications of existing duties . . . or such additional import restrictions, or such continuance . . . of existing customs or excise treatment of any article covered by foreign trade agreements, as are required or appropriate to carry out" such agreements. The President may not modify existing customs duties beyond 50% nor may he transfer any article between the dutiable and the free lists. The duties thus proclaimed by the President are made applicable to the products of all countries, except that the President may suspend their application to the products of any country "because of its discriminatory treatment of American commerce or because of other acts or policies" which tend to defeat the purposes of the act. The exceptional situation of Cuba is recognized by a provision for an exclusive preferential agreement with Cuba, thus continuing the preferential relationship established by the Commercial Convention of 1902.

The trade agreements program, designed to combat existing world tendencies toward economic nationalism, has a two-fold objective. It seeks, first, the reduction or elimination of excessive trade barriers. Trade barriers such as impede international commerce cause diminished national incomes, depressed standards of living, increased unemployment, financial instability and social unrest. The second objective of the program is the elimination of trade discriminations. Trade discriminations lead to constantly shifting trade currents, commercial uncertainty and insecurity, retaliations and retaliations, trade conflict and the kind of economic tensions that can lead to war.

The success of the program has been marked. During the five-and-a-half years after its inauguration, agreements were concluded with 21 countries (two with Canada). Announcements have been made of intention to negotiate a revised agreement with Belgium and an agreement with Chile. The proportion of total United States trade which is conducted with trade agreement countries is indicated in the chart at the top of the page.

The influence of the trade agreements program in stimulating the foreign trade of the United States is indicated in the chart below which shows the increase during the two-year period of 1938 and 1939 over the two-year period of 1934 and 1935 of exports to, and imports from, trade agreement countries as compared with other countries.



INCREASE IN UNITED STATES EXPORTS AND IMPORTS under the trade agreements program. The chart shows increase of 1938 and 1939 (average) over 1934 and 1935 (average). Last two months of 1939 estimated

The effects of the program are world-wide. With the powerful leverage which it affords, the United States has been able to make definite progress in countering the world movement toward economic nationalism and trade discrimination. (See also INTERNATIONAL TRADE; TARIFFS.) (H. F. G.)

Trade Unions: see LABOUR UNIONS.

Traffic Accidents. The downward trend of the automobile accident rate in the United States, based on deaths per 100,000,000 vehicle-miles, which began in 1934, continued through 1939 with a 7% reduction from the rate of 1938. The rate in 1939 was 11.5. In lives lost in traffic accidents there was a 2% reduction in 1939 from 1938.

This progressive march toward safety on the streets and highways of the country was attributable to the constantly increasing effectiveness of the administration of traffic safety functions by city and State officials who were backed up by civic and professional groups and the people at large.

Outstanding achievements in the field for 1939 may be grouped under the seven headings of the model highway safety program which was drafted and endorsed by 12 leading organizations interested in safety in the United States. The seven points and major achievements under them are as follows:

Legislation.—Continued adoption by States of all or parts of the Uniform Motor Vehicle Code and by cities of the Model Municipal Traffic Ordinance, both of which were drafted by the National Conference on Street and Highway Safety.

Motor Vehicle Administration.—Improvement in motor vehicle administration in States with more adequate accident reporting systems, better examinations for new drivers, and the more efficient suspension and revocation of drivers' licences for cause.

Enforcement.—Rapid spread in cities and States of the investigation of accidents and of selective enforcement, as recommended by the Safety Division of the International Association of Chiefs of Police.

Engineering.—Completion of the Highway Planning surveys by the Public Roads Administration in collaboration with State highway departments.

Education.—Preparation of the 1940 yearbook of the American Association of School Administrators which is entirely devoted to safety education in schools; co-operation of more than 100 teachers' colleges and universities in conducting credit courses in safety education during the summer of 1939; and publication of adequate school courses in safety by eight State departments of public instruction, thus bringing to 37 the number of States with such courses.

Training Personnel.—Training of about 150 traffic officers in both short and long courses by the Northwestern University Traffic Institute; training of almost 500 traffic officers by the Safety Division, International Association of Chiefs of Police; training of more than 50 teachers in safety education by the National Center for Safety Education at New York University; training of 40 traffic engineers at the Yale Bureau for Street Traffic Research.

Research.—Publication of a study entitled "Installing Tests for Intoxication" by the National Safety Council and the continuation of the exhaustive study of enforcement methods by the National Committee on Traffic Law Enforcement under the chairmanship of Arthur T. Vanderbilt.

Among the organizations most active in the safety field during 1939, in addition to those already mentioned, were the Automotive Safety Foundation, American Automobile Association, and the National Conservation Bureau.

Great Britain.—Fatal accidents during the first eight months of 1939 approximated the number during the corresponding period of 1938, according to the Ministry of Transport. If this rate had continued through to December 31, the 1938 toll of 6,440 deaths would have been about equalled. On November 3, the Ministry stated that it was "too early to form any reliable estimate of the effect of war conditions upon traffic conditions and the accident rate," but in December it was reported by reliable sources that during the first three months of the war no fewer than 3,000 persons had lost their lives on the streets and highways in Great Britain. This great increase was accounted for by the "black-outs"; for on September 1, Order No. 1098, relating to restrictions on lighting, was promulgated under the Defence Regulations. The order drastically restricted vehicle and road illumination. (F. M. K.)

Trailer Travel. The trailer coach industry, one of America's newest businesses, has established itself on a permanent basis. Ten years ago, the "house trailer," as it was then known, was an oddity. In 1939 while there are no definite figures available, it was estimated that there were more than 300,000 trailer coaches in the United States.

The Trailer Coach Manufacturers' Association, official organization of the principal manufacturers, has more than 35 members who either manufacture trailer coaches or are suppliers of parts. In addition, there are some 30 other trailer manufacturers and approximately 100 suppliers of trailer parts. The estimated production of trailer coaches during 1939 was 25,000.

Trailer parks have been and are being established throughout the 48 States. Florida has been the most forward-looking State in this regard, but her sister States are rapidly recognizing the importance of this addition to the tourist industry. (P. E.)

Transatlantic Flying: see UNITED STATES: Aviation.

Transbay Bridge: see BRIDGES.

Trans-Jordan. Area 34,740 sq.mi.; pop. c. 312,000. Chief towns: Amman (cap.) c. 20,000; Es-Salt c. 10,000. Ruler: Emir H. H. Abdullah ibn Hussein, G.C.M.G., G.B.E.; high commissioner: Sir Harold MacMichael, K.C.M.G.; British resident: A. S. Kirkbride, O.B.E., M.C.; prime minister: Tawfiq Pasha Abdul Huda; language: Arabic; religion: Moham-medan (25,000 Christian Arabs).

History.—As a result of important reforms in its constitution, Trans-Jordan entered on a new phase of development during 1939. According to arrangements agreed to in principle by the British Government in May, the existing Executive Council was in August replaced by a Council of Ministers or Cabinet, each member of which is in charge of a department and is responsible directly to the Emir. Restrictions were also removed upon the Emir's power of raising and maintaining military forces, and there was a relaxation of the close control formerly exercised by the British Government over finance and administration. Such changes will, the British Government believes, "contribute effectively to the further progress of Trans-Jordan towards the goal of full independence."

The main objectives of present day Trans-Jordan are those of security, land development and the improvement of local standards of living. In furtherance of the first, a peace settlement was made in August of a long standing feud between the tribal heads of two sections of the Howeitat tribe which inhabits southern Trans-Jordan. In the same month the Trans-Jordan Frontier Force, which has been extremely successful in suppressing tribal raidings, seized a store of ammunition in the village of Arrabya, and a bandit headquarters was discovered and destroyed.

Land settlement is now progressing to keep pace with the rapidly increasing population.

Education.—In 1938-39: elementary Government schools 72; scholars 8,512.

Finance.—Revenue (1938-39) £P529,615; expenditure (1938-39) £P547,546; public debt (Dec. 31, 1938) £P31,009.

Trade and Communication.—Overseas trade 1937: imports, merchandise £P788,714, specie £P96,032; exports, merchandise £P472,399, specie £P112,950; re-exports £P92,545. Communications 1939: roads, Amman-Es-Salt highway completely asphalted and in good condition; railways, narrow gauge, 200 miles. Motor vehicles licensed: 103 private passenger cars; 185 public passenger cars; 15 buses; 231 commercial vehicles; 64 Government vehicles; total 598.

Agriculture.—Production (export) 1938 (in metric tons): fresh fruit 1,557 (£P15,656); wheat 32,619 (£P324,103); wool 33 (£P1,149).

Transvaal: see SOUTH AFRICA, THE UNION OF.

Trap-shooting. Beginning with the doubles and distance championship of the New York Athletic club, at Travers Island, N.Y., in April, trap-shooters went through an active season in 1939. Tom Lawrence took the first title event, and Fred A. Cauchois captured the other from the 21-yd. line. At the annual clay bird championship shoot at the N.Y.A.C. the winner of the singles was Steve Crothers, 179x200.

The distance title went to John D. Rigg, off the 24-yd. line, with 97x100.

Walter Beaver covered himself with glory at the annual Clarence Marshall classic, at Yorklyn, Del., winning the "Marathon," "Brandywine," "Auburn Special" and the doubles title.

The Grand American, held under the auspices of the American Trap-shooting Association, the premier shoot in trapdom, was attended by 1,000 shooters, at the Vandalia, Ohio, traps. D. L. Ritchie won the G.A.H.; Walter Winteringham took the preliminary handicap; P. O. Harbage captured the clay target championship; Walter Peterson led in the champion of champions race; John D. Rigg shot his way to victory in the National doubles championship; Fred Tomlin excelled in the contest among professionals at 16 yards; John Peterson won the senior race; Rudy Etchen topped the juniors for title honours; the husband and wife title went to Mr. and Mrs. John K. Sanders; Joe Hiestand and Homer Clark, Jr., shot 594x600 at 16-yd. targets; Phil Miller scored 880x900 on all targets and Jack Lindsay made the longest run of the week, 353. Mrs. William Gilbert won the women's National title.

At the Jenkins Brothers' fall tournament, at Orleans, Ind., Joe Hiestand won the world's all-around championship at targets and flyers for the third time. The Westy Hogans staged their annual shoot at Asbury Park, N.J., in October, and to E. B. Springer went the trophy for breaking 100 straight targets. John von Gonsic captured the Cosmopolitan championship with 100 straight and the class B title; Lynn Hunt took the class A. The Hunters Special shoot at North Platte, Neb., brought out a new winner in Art Carmody, who captured the 50-target event after a shoot-off. The grand prize was won by Ralph Haws. (J. B. P.)

Trinidad: see WEST INDIES, BRITISH.

Tropical Diseases: see MALARIA.

Trotting: see HORSE RACING.

Trucial Sheikhs: see ARABIA.

Truck Farming. Unlike the acreage of vegetables for fresh marketing, which increased in 1939 in the United States to a new high, the acreage of truck crops for processing, harvested in the United States in 1939, was only 1,105,000 ac., a decline of 21% from the acreage of 1938 and of about 29% from the record-high acreage of 1937. Production runs in an approximate ratio to acreage. Commercial truck crops follow a cyclical course, the United States Department of Agriculture points out, and adds that the lower acreage and production of 1939 are apparently the low point in the present cycle from the high of 1937. Usually carry-over stocks of processed vegetables increase for three years until the surplus becomes burdensome. Then planting and production decline for about two years until the supply is normal. At this stage acreage and production start on an increase. Most truck crops for processing are contracted before planting. Production of all such crops in the United States was 2,826,930 short tons in 1939 and 3,619,920 short tons in 1938, while the ten-year (1928-37) average was 3,282,660 short tons, the Department of Agriculture reports. The only crops showing an increase in 1939 over 1938 were asparagus, spinach and toma-

atoes. Lima beans were only slightly reduced, but all others were sharply less. Prices received by producers in 1939 were about 8% under 1938 and about 16% less than in 1937. Production follows:

	1939 short tons	1938 short tons	1928-37 short tons
Asparagus	47,610	44,660	54,250
Beans (limas, shelled)	28,650	28,730	15,000
Beans (snap)	90,700	128,400	75,500
Beets	38,740	70,780	40,600
Cabbage (sauerkraut)	146,600	195,400	153,800
Corn (sweet, in the husk)	647,900	882,800	647,800
Cucumbers (pickles)	92,620	146,570	125,800
Peas (green, shelled)	193,950	302,540	193,660
Pimentos	23,190	38,840	15,110
Spinach	47,200	38,600	52,250
Tomatoes (q.v.)	1,925,500	1,742,600	1,458,600

(See also MARKET GARDENING.)

(S. O. R.)

Trucks: see MOTOR TRANSPORTATION; MOTOR VEHICLES: *Commercial Vehicles*.

Trust Indenture Act: see LEGISLATION, FEDERAL.

Tuberculosis. *Diagnosis.—Tuberculin Test.*—The work of 1939 continued to emphasize the seriousness of tuberculous infection and the fact that 20% to 40% of apparently well, infected persons later fall ill. The post-mortem work of Feldman indicates that in many lesions of the first infection type, the bacilli completely disappear. Approximately 20% of the students of medicine and 24% of the students of nursing who entered Vanderbilt university as tuberculin reactors lost their sensitivity to tuberculin before graduation, which probably indicates that the tubercle bacilli in their bodies had died. On the other hand, Holló is of the opinion that those who become infected with very few exceptions remain infected all their lives. It is now known that a typical reaction to tuberculin nearly always indicates foci of living tubercle bacilli in the body. Therefore, the tuberculin test *continues to be the first screen in every age period of life*. A modification of one of the old methods of administering tuberculin, known as the patch test, was found by Weiner *et al.* of New York, and Court of England, to be slightly less satisfactory than the usual method of administration. Most workers are of the opinion that it will not become a substitute for the method of Mantoux.

X-Ray.—The X-ray examination of the lungs is the most effective method of locating macroscopic areas of disease. Several methods were employed during 1939.

(1) The usual slow X-ray equipment of offices and hospitals was most used. Both celluloid and paper films were employed with essentially the same results.

(2) The rapid method greatly increased in favour during 1939. The number of exposures possible per day is four or five times greater than by the slow method. When 500 or more examinations are made, the cost of the film delivered to the physician is 75 cents per person. The finished film is satisfactory in every respect.

(3) Roentgen-photography was used by Holm of Copenhagen, de Abreau of Brazil and others, who found it valuable and inexpensive.

(4) A new method consists of making a very small X-ray film of the chest, known as the microfilm. This must be projected on a screen for interpretation and there is still some question whether it will be adequate for detailed work.

(5) Stiehm devised a special fluoroscopic unit with which he has been able to detect areas of disease that were entirely missed by the usual X-ray film examination.

Laboratory Examination.—In the presence of silica, tubercle bacilli proliferate rapidly in the animal or human body. Pickof injected silica suspension just beneath the skin in the flank of a guinea-pig and within the next two or three minutes he injected into the same area material suspected of containing tubercle bacilli, such as sputum in which germs could not be found by the direct microscopic examination; the bacilli when present multiplied so rapidly that in some cases within 10 to 15 days material aspirated from this area was found to contain tubercle bacilli in abundance. This method makes the diagnosis possible in approximately the same time as the method of introducing suspected

material into the body of a guinea-pig which does not react to tuberculin. Repeating the tuberculin test in 12 to 15 days usually results in a reaction if bacilli are present.

Surveys and Reports.—The eighth annual report of the Tuberculosis Committee of the American Student Health Association showed that among 37,000 students tested, 26% reacted to tuberculin. Progressive tuberculosis was discovered in 229 students.

Mencia *et al.* administered 27,000 tuberculin tests in Cuba and found 69.6% reacted. X-ray films by the rapid method of 10,949 reactors led to the finding of clinically manifest disease in 2.71%.

In Germany the sailors' union arranged for examinations of 18,000 sailors, following which sailors were no longer employed on German ships without certificates of examination. The German army is being examined by Roentgen-photography as a screen.

Treatment.—Drugs. Sulphanilamide, so valuable in certain diseases, such as gonorrhoea and streptococcus infection, has been found of little value in tuberculosis.

Fever Therapy in animals resulted in temporary improvement and prolongation of life. However, Krusen and Elkins recognize the grave danger of this method to patients and recommend that at present it remain in the hands of research workers.

Treatment of Young Adults Discouraging.—Zacks reported results of treatment of various forms in 532 young adults, mostly in the second decade of life, which are extremely discouraging. Among adolescents who had cavities in the lungs, even though treated, Simon found the disease proved fatal in approximately two-thirds.

Tuberculosis in General Hospitals.—Mikol and Plunkett examined 4,853 adult admissions, exclusive of those known to have tuberculosis in 14 general hospitals in 10 cities of upstate New York. Evidence of reinfection type of disease was found in 2.6%. The incorrigible, contagious case of tuberculosis is a serious menace to the health of the community. Harrington has begun to quarantine such cases in a general hospital and a sanatorium, as is done with other contagious diseases, such as diphtheria.

Tuberculosis in Physicians and Nurses.—Diehl has found that tuberculosis was responsible for one-fourth of all deaths among the graduates of the University of Minnesota medical school from 1919–36. He concluded that the hazard of tuberculous infection for medical students can be reduced by the application of modern control measures. A seven-year study of tuberculosis in nurses in the Cook County (Ill.) hospital led to an elaborate tuberculosis control program among the nurses. Observations on 757 students of medicine and nursing at Vanderbilt university where isolation technique was used showed that the number of students who became infected was much smaller than reported from most other institutions. Harrington *et al.* reduced by one-half the infection attack rate among students on a general hospital tuberculosis service by contagious disease technique similar to that employed in diphtheria. He believes that with improvement of technique the attack rate can be reduced to approximately that of the general public.

Immunity.—In an extensive review of the literature on immunology of tuberculosis, Lurie concluded that Calmette's vaccine (BCG) reduces definitely the tuberculosis mortality of exposed infants in the first year of life but that it can scarcely be expected to protect against marked reinfection during adult life.

Rehabilitation of tuberculous patients received much attention in 1939. Boards of health, departments of education, divisions of social welfare, State medical associations and others co-operated in the development of rehabilitation programs. Hochhauser presented the problem of the employment of ex-tuberculous patients in industry.

Mortality.—In the United States the mortality rate from tuberculosis in 1938 was 48.6 per 100,000; in 1928 it was 79, and in 1904 it was 202. In practically every nation reports show that mortality from tuberculosis is decreasing.

The program of controlling bovine tuberculosis throughout the nation by the United States Bureau of Animal Industry, in co-operation with the various States, continued to be most successful. Of the 3,072 counties in the nation, all but four have the modified accredited rating, which means that only .05% or less of the animals react to tuberculin. The remaining four counties will probably be accredited in early 1940.

The great value of controlling tuberculosis among the cattle herds of the U.S. has become more evident since Griffith and Thompson of England, Hedvall and others of Scandinavia, Huet of Holland, and workers in other European countries, have determined that so many cases of tuberculosis in human beings are caused by the cattle type. In nations where the disease has not been controlled among the cattle, as many as 25% of the cases of tuberculous meningitis, 20% of the cases of disease of the bones and joints, 50% of tuberculosis in the lymph nodes, and 3% to 6% of the cases of pulmonary tuberculosis have been found due to the cattle type of tubercle bacillus. Tuberculosis in swine and poultry continues to be a serious problem in the mid-western States, and the Bureau of Animal Industry, in co-operation with the various States, is making great strides in the solution of this problem. The dissemination of information concerning tuberculosis continued to be the major activity of the National Tuberculosis Association and its component organizations. In Nov. 1938 Potter concluded a series of eight splendid articles published in *Hygeia* under the title, "Tuberculosis Up to Date," which aided greatly in this program. (See also RADIOLOGY.)

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Tungsten. The world's tungsten producing industry centres mostly in South-eastern Asia, whence came 56% of the 1938 total of 37,000 metric tons of concentrates (60% WO₃ basis), a small decrease from 1937; 36% of this total came from China, 9% from Burma, 3% from Malaya, and 8% from other adjacent territories, chiefly Chosen. Of production elsewhere, the United States supplied 7%, Bolivia 7% and Portugal 8%; other outputs are small and widely scattered.

Due to the disturbances incident to the Japanese invasion of China, the Chinese exports for 1938 dropped one-quarter below those of 1937. Shipments during the first half of 1939 were about 30% below the 1938 average; shipments were made through Hongkong and Indo-China, in about equal amounts; information is lacking as to developments later in the year. Exports from Burma and Bolivia during the same period were about at the 1937 level.

The United States industry is very erratic, and in spite of exceptionally heavy tariff protection is more or less at the mercy of world prices; production has been increasing consistently, however, since the depression low in 1932, reaching 3,180 metric tons in 1937. In addition to the domestic output the U.S. imported in 1937 about 5,300 metric tons of concentrates (60% basis), besides metal, alloys, compounds, etc., equivalent to 155 tons of concentrates. Imports were radically reduced in 1938, the equivalent total being only 185 tons of concentrates, but increased to 730 tons in the first 10 months of 1939.

The British Empire controlled 27% of the 1938 world output; 53% of the Empire total was in Burma, 17% in Malaya, 15% in Australia, 3% in Africa and 4% in Cornwall.

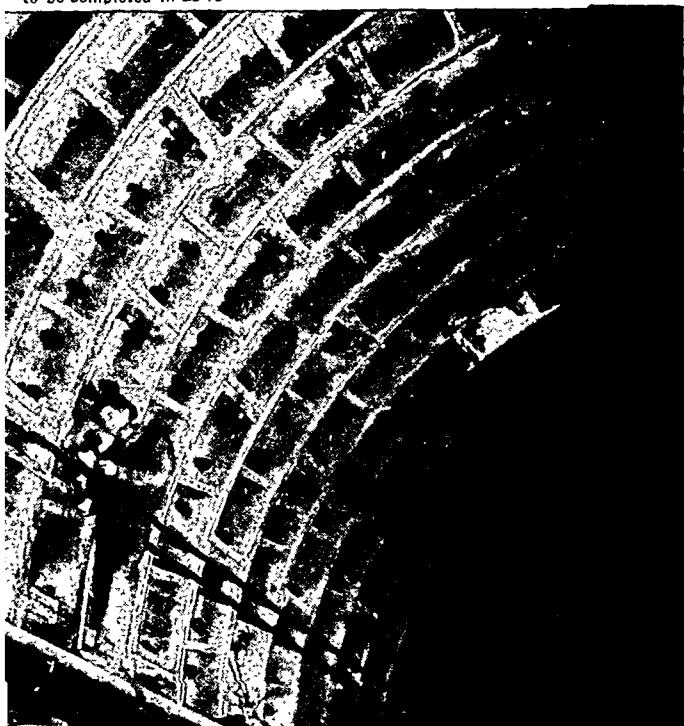
Germany is the largest consumer of tungsten, with 1938 imports of 15,400 metric tons (60% basis). War conditions may be expected to increase the demand for tungsten in appreciable amounts. (See also METALLURGY.) (G. A. Ro.)

Tunis: see FRENCH COLONIAL EMPIRE.

Tunnels. The year 1939 saw considerable activity and diversity of tunnelling conditions in rock and also in earth, with and without the assistance of compressed air in the workings as usual means of stabilization of "soft" ground, facilitating the skilled operations of miners in combatting earth forces. In this connection it is noted that in the early part of the year the U.S. Public Health Service and the U.S. Bureau of Mines instituted an experiment in the New York city Queens-Midtown Tunnel by which to minimize compressed air illness. During exit or decompression it provided the workers with masks connected to a supply of pure oxygen to breathe in place of the usual tunnel air. It appeared that by this means the nitrogen absorbed by the human body was more readily expelled and thus prevented formation of bubbles of nitrogen, the main source of compressed air illness. The practical conclusions on this experiment are not yet available.

A notable evolutionary feature in the design of shields for

WORKMAN testing section of vehicular tunnel under East river, New York city, to be completed in 1940



"soft" ground tunnelling during the past 40 years is simplification affording more direct attack on the tunnel faces to be mined. To this has been added time- and labour-saving devices for the handling of excavation and materials of plant and structure. The most recent and noticeable example of this was on the Queens-Midtown tunnel above mentioned. The "holing-through" of this Queens-Midtown Highway tunnel occurred on Nov. 8, 1939, thus terminating the driving of two tunnels of 31-ft. diameter through formations of rock and glacial materials with stretches of a combination of both. This hazardous work was carried out with efficiency and safety to the men engaged upon it. Each of the tunnels is about 4,000ft. long and the actual tunnel work thus far (Jan. 1, 1940) was done in 28 months; a very good record in the face of geological conditions.

The New York City Independent passenger transit system finished the two-tunnel part of its 6th avenue extension from 9th street to 13th street with the assistance of compressed air in "soft" ground and in the face of difficulties with interference of existing substructures.

The City of Chicago started work on its extensive passenger transit subway system. This system is being constructed in "soft" ground, a somewhat plastic clay, at moderate depth below street surfaces. The stations with island platforms are being constructed in part by a shield for each of the two track spaces and part of the intervening platform space mined by hand. The tunnelling from station to station is for a twin arched rectangular cross-section mined with the use of steel "liner" plates. All tunnel work is being performed under compressed air.

In London where most of the underground railway transit is at great depth below street surface one extension of 10mi. to the east and another of 6mi. to the north, in all 32mi. of tube tunnel, begun in 1937, was practically completed in 1939.

Work on the highway tunnel under the River Thames from Purfleet to Dartford about 20mi. downstream from London bridge has been stopped because of the war. A pilot tunnel and the shield chambers and two shields for the construction of the main tunnel were completed. The scheme provides for one main tunnel with provision for another parallel with it at 61-ft. centres. The external diameter of the tunnel is 30ft. 6in. There is a 20-ft. roadway between curbs. All the tunnelling operations require use of compressed air.

In the United States much rock tunnelling is in progress.

The San Jacinto tunnel, 13mi. long, part of the Colorado River aqueduct, which took over five years to excavate under serious difficulties in combatting great volumes of water, was completed in 1939.

All sections of the 85mi. of Delaware River aqueduct tunnels for the New York City Water Supply are under contract. Good progress was made on the older sections and most of the newer ones made good beginnings. The sinking of an auxiliary construction shaft to a previously driven drift was accomplished by boring a 3-ft. diameter Calyx drill hole followed by drilling and blasting to full size using the drill hole as a ready means of disposal without head gear, other items of plant and a minimum of labour. The ventilation provisions on these tunnels are commendably in keeping with progressive efforts to protect the health of the workmen.

It is reported a world's record was established for rock excavation when 1,534ft. of a drift of about 8ft. by 9ft. was driven in the month of October at the Carleton Drainage tunnel, Cripple Creek, Colorado, in granite requiring no support.

The largest program of traffic tunnels so far attempted was started in 1939 on the Pennsylvania turnpike, a super-highway of 160mi. over the Allegheny mountains, between Harrisburg and Pittsburgh. There are seven tunnels in the project, aggregating 6.7mi. long. Six of the seven bores are enlargements of the abandoned South Pennsylvania railroad tunnels; the seventh is on a new location. None of the old tunnels was completely holed through. This is high speed work, as the contract time is very short requiring the tunnels to be completed by May 1, 1940. The tunnels will have a clear inside width of 28½ft., 23ft. of which is roadway. The height from roadway to soffit of arched roof is 20 feet 6 inches. Walls are 18-in. minimum thickness. The roof is arched to 14ft. 3in. radius. Between the roadway ceiling and the arch is a ventilating air space, similar to that on Holland and Lincoln tunnels. A 4-ft. egg-shaped drain under the roadway is provided, with transverse drains to dispose of water. (J. FE.)

Turkestan, Chinese: see SIN KIANG.

Turkey, area (including Hatay) 296,500 sq.mi.; pop. (est. March 31, 1939) 17,829,000. Chief towns: Ankara (cap., 122,720); Istanbul (690,857); Izmir (170,959). President: General Ismet İnönü; language, Turkish; religion, Mohammedan.

History.—In spite of the loss of their great leader Kemâl Atatürk in 1938 and the anxiety caused by fears of Italian aggression in the eastern Mediterranean, the Turks faced 1939 with calm confidence. The Cabinet resigned on January 26, when Dr. Refik Saydam became prime minister. The invasion of Czecho-Slovakia by Germany alarmed the Turks by its revelation that the German "Drang nach Osten" had not been abandoned, and the Italian seizure of Albania confirmed them in their desire to seek a close understanding with France and Great Britain and led to immediate negotiations between the three Governments.

On May 12 the decision of the British and Turkish Governments to conclude "a definite long-term agreement of a reciprocal character in the interests of their national security" was announced. Its details remained to be negotiated, but both Governments declared meanwhile that in the event of an act of aggression leading to war in the Mediterranean area they would assist one another to the extent of their power. They also recognized that it was necessary to ensure the establishment of security in the Balkans.

In mid-June the negotiations between France and Turkey concerning the future of the Sanjak of Alexandretta (Hatay) were successfully concluded. On June 23 a Franco-Turkish pact resembling the Anglo-Turkish agreement was signed in Paris together with an agreement for the cession of the Sanjak to Turkey, which provoked bitter German and Italian criticism. The cession was formally made at Antioch on July 23.

During the next five weeks negotiations for the transformation of the preliminary agreements into an alliance gathered speed. The Russo-German pact surprised but did not shake the Turks, and on August 29 it was announced that the staff talks between the three Governments had resulted in a complete understanding. When war broke out Turkey strengthened her forces, watched Italy and endeavoured to promote a general Balkan understanding. Meanwhile the attitude of the U.S.S.R. towards Turkey had changed. After approving the Tripartite pact they now criticized it. After announcing the partition of Poland, M. Molotov invited the Turkish foreign minister to Moscow to discuss a Turco-Soviet pact of mutual assistance to ensure the security of the Black sea and the Balkans. On his arrival M. Sarajoglu was invited instead to sign new agreements involving the revision if not the abandonment of Turkey's engagements to Great Britain and France and a breach of the Straits (Montreux) Convention of 1936. He refused and after a month's negotiation the conversations were suspended. On October 19 an Anglo-French Treaty of mutual assistance with Turkey was signed at Ankara. Its main points were:—

Britain and France undertook to assist Turkey

- (a) if an act of aggression were committed against her by a European Power and
- (b) in the event of an act of aggression by a European Power leading to war in the Mediterranean in which Turkey became involved.

Turkey agreed to assist Britain and France

- (a) in the event of an act of aggression by a European Government leading to war in the Mediterranean in which these two Powers were involved, and
- (b) if these two Powers were engaged in hostilities in virtue of either of their guarantees to Greece and Rumania.

Another article provided for consultation between the three Powers in other cases of aggression. A protocol provided that the obligations of the Treaty could not compel Turkey to action having as its effect or involving as its consequence hostilities with the U.S.S.R. The duration of the Treaty was 15 years.

The Treaty produced wrath in Berlin, chagrin in Moscow and misgivings in Italy. In his survey of October 31, in which he admitted that the U.S.S.R. had urged Turkey to close the Bosphorus to the warships of non-Euxine Powers, M. Molotov accused Turkey of "entering the war orbit." Turkish diplomacy still worked for Balkan understanding but was opposed by Russia and Germany, and little helped by the Italian Government which, while adverse to Russian penetration of the Balkans, claimed almost a leadership in the Peninsula which no Balkan State would concede. After some tension caused by anti-Russian agitation in Bulgaria the relations between Ankara and Sofia became friendly and Turkey strove steadily for a Bulgaro-Rumanian understanding.

On December 27 an earthquake destroyed Erzinjan and inflicted disastrous losses on the cities and villages of Eastern Anatolia. Over 25,000 persons were believed to have perished, and floods and blizzards caused further loss and suffering. (P. P. G.)

Education.—In 1938: elementary schools 6,700, scholars 764,691; secondary schools 140, scholars 74,107; lyceum schools 68, scholars 21,000; normal schools 16, scholars 2,807; professional schools 47, scholars 7,574; universities 2, number of students 9,588.

Banking and Finance.—Revenue, ordinary (est. 1939-40), £T.261,110,000; expenditure, ordinary (est. 1939-40) £T.261,064,192; public debt (Dec. 31, 1938) £T.533,613,687; notes in circulation (Aug. 31, 1939) £T.220,000,000; gold reserve (Aug. 31, 1939) £T.36,000,000; exchange rate (under Anglo-Turkish Agreement) 587 piastres (£T.1=100 piastres)=£1 sterling.

Trade and Communications.—Foreign trade, merchandise: imports (1938) £T.149,836,689; (Jan.-Aug. 1939) £T.94,040,000; exports (1938) £T.144,946,511; (Jan.-Aug. 1939) £T.76,767,000. Communications 1939: road, total, c. 24,500mi.; railways, State, 4,316mi.; private 269mi.; shipping, State lines, 57,908 net tons; motor vehicles licensed (Dec. 1937), cars and taxis 3,443, commercial 6,041, cycles 724; wireless receiving set licences (Apr. 1938) 33,753; telephone subscribers (1937) 19,481.

Agriculture, Minerals and Manufacture.—Production 1938, in metric tons: wheat, 4,270,262; barley, 2,404,702; maize, 603,867; rye, 452,621; oats, 263,436; coal, 2,588,957; cotton, ginned, 66,300; tobacco, 53,162; wool, 31,484; mohair, 7,618; silk, raw, 2,348; potatoes, 168,735; beet sugar, 46,000; rice, 47,645; olive oil, 33,759; sesamum, 25,835; chrome ore (export), 104,000; antimony ore (metal content) (1937), 659. (See also BALKAN ENTENTE.) (W. H. WN.)

Turkmen S. S. R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Turks and Caicos Islands: see WEST INDIES, BRITISH.

TVA: see TENNESSEE VALLEY AUTHORITY.

Uganda: see BRITISH EAST AFRICA.

Ukrainian S. S. R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Ulster: see IRELAND, NORTHERN.

Undistributed Profits Tax: see TAXATION.

Undulant Fever: see VETERINARY MEDICINE.

Unemployment. The various nations in their reports to the International Labour Office, as of Dec. 1939, reported better employment in 1939 than in 1938. Throughout the world the picture improved particularly from the late spring of 1939 through the balance of the year. Preparations for war contributed appreciably to the acceleration of industrial activity both in Europe and in the countries which ship raw materials to Europe. The American business recession of 1937-38 did not affect the rest of the world seriously in 1938. The 21% decline in manufacturing employment in the United States between the summer of 1937 and that of 1938 produced no counterpart in any other nation.

The improvement during the first two-thirds of 1939, as compared with 1938, was not large. The later months of the year, after war broke out, produced more rapid advances in employment. Germany (including Austria), Japan, Great Britain, France, Denmark, Norway, Switzerland and Yugoslavia, particularly, felt the "war boom" by early summer.

The unemployment statistics of many nations are distinctly unsatisfactory and conclusions drawn from them are open to suspicion. The available figures are of two principal kinds, each gathered in several different ways; statistics of employment, *i.e.* of the number of people at work, and statistics of the number of people in need of work. Employment statistics are derived from "establishment" reports collected by mail or through field agents or labour inspectors. Unemployment statistics are furnished by the employment exchanges (applications for work), unemployment insurance systems (applications for benefits), unemployment relief records, reports of trade union secretaries and censuses of unemployment.

The various types of statistics agree reasonably well in their picture of what happened in the different countries but not always upon the extent of the changes which occurred.

Great Britain and Northern Ireland have three-fourths or more of their wage-earners (about 13,000,000) under unemployment insurance. Of these, 1,831,372 were wholly or temporarily out of work in Dec. 1938. In Jan. 1939 the number rose to 2,038,026 and then gradually declined to 1,430,638 by Oct. 1939. The summer and fall of 1939 saw unemployment at the lowest levels in Great Britain that it had been since 1929. The approach and reality of war was largely responsible for the low levels of unemployment. These figures are the numbers registered at the employment exchanges. The persons covered consist largely of insured unemployed required by law to be listed at the exchanges. If the 4,750,000 not covered by the insurance act were included in the figures, the unemployment percentage would be more apt to fall than to increase, since military service, the police, civil service, teaching and other relatively stable occupations are in this group.

Registrations of unemployed persons at the employment offices of the Irish Free State increased fivefold from the pre-depression years to 1935. Moderate declines in unemployment in 1936 were followed by a sharp decline in 1937. In 1938 the number of applicants began to increase and reached the highest levels since 1934 in Jan. 1939. From January through April approximately 105,000 were registered each month; thereafter the registrants decreased rapidly to approximately 70,000 in the summer.

Unemployment remained at high levels in France during the first half of 1939. It had reached its peak in 1935-36. The decline during 1937 was small. Conditions got worse in 1938. The year 1939 began with unemployment nearly as bad as in 1935. But by August a third of the unemployed were back to work. The employment exchanges had 460,816 registered in January and 333,150 in August.

The high unemployment figures which had obtained in the Netherlands since 1933 continued until March 1939. The winter of 1938-39 was very bad. From April improvement was rapid. There were 405,927 registered at the employment exchanges in January and less than 215,000 after April. The percentage drawing unemployment insurance benefits decreased from 31.3% to 19.5% from January to October.

Belgium experienced marked improvement in 1937 but with worse conditions in 1938. The average number unemployed increased from 125,929 in 1937 to 173,913 in 1938 and 221,468 in Jan. 1939. Unemployment continued at high levels in Belgium for the first eight months of 1939. The figure was 222,884 in September. In 1931, by contrast, it was 110,000. In 1937, the insured workers of Belgium lost 13.1% of their possible working

time; in 1938, 17.6%; in 1939 (eight months) 18.3%.

Denmark, Norway and Sweden all experienced moderate improvement during the first eight months of 1939 following slightly worse unemployment in 1938 than in 1937. Denmark's percentage of trade unionists unemployed was 21.4% for 1938. This percentage rose to 29.9% in Jan. 1939, then dropped to 11.1% by June. Norway's in 1938 was 22%, in Jan. 1939, 27.6% and July, 11.8%; Sweden's in 1938, 11.8% and in 1939, 9.3%. In the summer of 1939 the Swedish figures approximated pre-depression levels, averaging 6.5%, but in Denmark the summer average was 11.1% and Norway 13.5%. In the first half of 1938, there was little change in unemployment conditions in the Scandinavian countries.

The German census of 1933 recorded 32,300,000 people in the employable population, of whom 5,900,000 were unemployed. The average number of applicants at employment exchanges dropped from 912,312 in 1937 to 301,897 in Jan. 1939. It then fell rapidly to 93,933 in April and to 38,379 in July. The percentage of the insured population idle reached minimum figures in 1939. After January, when it was 1.5%, it dropped steadily .2% in June and was below 5% all summer. This is below what is ordinarily considered "zero employment."

Switzerland's employment exchange figures are unusually reliable measures of unemployment because both the relief act of 1919 and the unemployment insurance law require applicants to register at the employment exchanges. From 1927 to 1929, 2.2% of the employable population were wholly unemployed and 1.6% partially. For practical purposes, this is zero unemployment in any country. In 1929 an average of 8,131 applicants registered at the employment offices (out of about 2,000,000 employables). In Jan. 1939, the figure was 85,377. Month by month the registrations declined to a low of 25,275 in September. During the first eight months of 1939 the unemployment situation was approximately the same as in 1931 and the best it had been since 1931.

The Italian index of employment (1929=100) was down to 78.5 in 1932 and back to 94.9 in 1936, 104.5 in 1937 and 110.7 in 1938. The index for 1939 continued to move upward as a result of European wars. Taking into account the growth of population, these figures indicate employment in the reporting establishments approximating the 1929 level in the early summer of 1937. Statistics for Italy during 1938 were not available.

Czecho-Slovakia and Yugoslavia both had a rapid improvement in employment in 1937 followed by slight additional improvement in 1938. The Czecho-Slovak figures for late 1938 and 1939 were disturbed sufficiently by the seizure of the country by Germany so that they are non-comparable with the earlier figures. But they show marked reductions in unemployment.

Yugoslavian employment exchange statistics record an average of 22,517 registrants for work in 1938. The number exceeded 30,000 during the winter of 1938-39, then moved gradually downward to approximately 17,000 in the summer of 1939.

The only Mexican figures on unemployment are "official estimates." The figure given for 1930 was 75,695; 1932, 339,378; 1938, 204,702; and the first four months of 1939, 210,659.

The general trend of employment in the United States and Canada was downward in the first half of 1938, with severe unemployment, particularly in the United States, until the spring of 1939. There was then steady improvement the balance of the year.

The Canadian employment index (1929=100) averaged 97.7 for 1937 and 94.8 for 1938. The index was at 90.5 in Jan. 1939 and rose to 98.5 in August. It rose sharply during the last third of the year but the exact figures were not available. The employment exchanges carried average registrations of 105,236 the first seven months of 1939. Estimated unemployment dropped from 485,000, Jan. 1939, to 352,000, Aug. 1939.

UNEMPLOYMENT INSURANCE—U.S.S.R.

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General Indexes of Factory Employment and Payrolls U. S. A.

Source: *Monthly Labor Review*, November, 1939, p. 1258.

(1923-25=100)

Employment

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1929	101.7	104.1	105.4	106.7	106.5	106.8	107.3	109.2	110.3	109.0	104.6	100.7	106.0
1932	70.0	71.2	70.1	67.8	65.2	63.2	61.0	62.7	66.1	67.2	66.3	65.1	66.3
1936	92.1	92.2	93.4	94.7	95.4	95.9	97.1	99.9	101.9	103.2	103.3	104.4	97.8
1937	102.7	105.3	107.7	108.8	108.9	107.5	108.0	109.1	109.0	107.2	101.1	94.5	105.8
1938	87.8	88.2	87.7	85.7	83.4	81.6	81.9	85.7	88.8	..	..	..	..
1939	92.2	93.6	94.3	94.1	93.0	93.4	93.5	96.4	..	..	..	..	..

Payrolls

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1929	103.8	110.8	113.0	114.1	114.3	112.7	108.6	113.5	114.4	113.7	104.9	101.2	110.4
1932	54.0	55.4	53.6	49.6	46.8	43.7	40.4	41.4	44.0	45.8	43.6	42.4	46.7
1936	76.7	76.6	80.3	82.3	83.9	84.1	83.4	87.1	86.9	92.5	94.0	98.8	85.6
1937	94.4	99.7	105.5	109.3	109.7	107.0	104.6	108.2	104.4	104.5	92.9	84.2	102.0
1938	75.0	76.9	77.1	74.6	72.9	70.8	70.6	76.8	81.0	..	..	..	..
1939	83.7	86.0	87.6	85.5	85.0	86.5	84.4	89.8	..	..	..	..	..

The United States took a special census of unemployment, Nov. 20, 1937, which recorded 7,822,912 as unemployed (2,001,877 of whom were employed on Government relief work). This census was a voluntary report of individual citizens on forms left at all homes by the postal service. Sample tests made on 1,455 mail routes indicated that a 100% return might have shown as many as 10,800,000 idle on November 20. A half-million workers were laid off in Nov.-Dec. 1937. Comparing these figures with the 13,500,000 to 14,500,000 idle in 1932-33, the 1937 unemployment figure was discouragingly large. Minimum unemployment for the United States would be 1,500,000 to 2,000,000.

Previous to 1930 the American economic system expanded each decade rapidly enough to absorb the growth of population. During the '30s economic growth failed to keep pace with the growth of labour supply. The unemployment of 1937 was in considerable measure due to this factor.

The factory employment index of the U.S. stood in the census month (Nov. 1937) at 104.1 (1923-25 base). A year later it was 93.3 and from Jan. to Aug. 1939 ranged between 92.2 and 96.4. It rose during the later months of the year but the exact figures were not available. The low point for the '30s was in 1932 when it fell to 66.3.

Payrolls always fluctuate more violently than employment because of over-time and part-time work. The monthly average of payrolls (1923-25=100) was 110.4 in 1929; but 46.7 in 1932; 85.6 in 1936; 102.0 in 1937; 77.9 in 1938 and 86.6 during the first seven months of 1939.

There were employed on public work financed by other than "regular" appropriations in the United States, approximately 3,423,000 people in June 1938. This was the highest monthly figure for work relief down to the end of 1939. There were 2,671,462 in Sept. 1939. Further substantial decreases occurred during 1939.

While employment exchange statistics are available for the U.S. the figures have been so profoundly influenced by relief, public works and other governmental policies that they cannot be used without careful explanation of their gyrations.

Japan was one of the nations with high employment in 1937, a by-product, of course, of war. Their employment index (1929=100) was 128.8 in 1937, and 141.8 in 1938. In 1939 it rose to 158.0 in June. The Government's official estimates of unemployment in 1932 estimate that but 6.8% of their employable population was idle, a figure hard to reconcile with an employment index of 82 that year. For Jan. 1939, their unemployment estimate was 212,254. The estimates were about 60,000 lower during 1939 than for the corresponding months of 1937. Japanese unemployment was low, 1937-39.

New Zealand's are entirely employment exchange figures. They indicate a gradual improvement in employment after 1934,

with 1937-38 distinctly better than any year since 1933. The numbers registered ranged between 1,000 and 9,000, Jan. to Aug. 1939. These are extremely low figures, corresponding to those of 1928-30.

The only unemployment figures for Australia are compiled from reports sent in by union secretaries—a not very satisfactory type of unemployment statistics. The Australian trade union returns show 31,000 or 7% of the union workers unemployed (monthly average) in

1927; a figure which grew steadily to 120,454 (29%) in 1932 and then gradually subsided to 53,992 (12.2%) in 1936. The figures averaged 41,823 in 1937 and 40,526 in 1938. In 1939, there was an increase to above 46,000 in the first half of the year.

The employment exchange registrations in Chile jumped from an average of 29,345 in 1931 to 107,295 in 1932, and then gradually dropped to 30,055 in 1934. Since then, applications for work have been at low levels. Registrations averaged only 10,672 per month in 1935, 6,474 in 1936, 3,215 in 1937 and 4,578 in 1938. During the first seven months of 1939 they ranged from 8,000 to 10,250. (See also SOCIAL SECURITY; UNITED STATES; WAGES AND HOURS.)

(D. D. L.)

Unemployment Insurance: see RELIEF; SOCIAL SECURITY.

Unemployment Relief: see RELIEF.

Unfederated Malay States, area 24,728 sq.mi., population (1931) 1,600,895, is one of the three main sub-divisions of British Malaya (see articles, STRAITS SETTLEMENTS and FEDERATED MALAY STATES). They consist of six States, of which five, Johore, Kedah, Perlis, Kelantan, and Trengganu, are located on the mainland of the Malay peninsula, while the sixth, Brunei, is on the island of Borneo. They are ruled by native sultans who have entered into treaty relations with the British Crown under which British advisers are appointed to the rulers. A number of British officials are employed in the service of the various States. Johore and Kedah are the most developed of the Unfederated States. There are Japanese iron concessions in Johore, which is on the mainland, opposite Singapore, and in Trengganu. Estimates of the population of the five land Unfederated Malay States in 1937 were as follows: Johore, 613,510; Kedah, 474,775; Perlis, 52,703; Kelantan, 400,378; Trengganu, 198,246. (W. H. CH.)

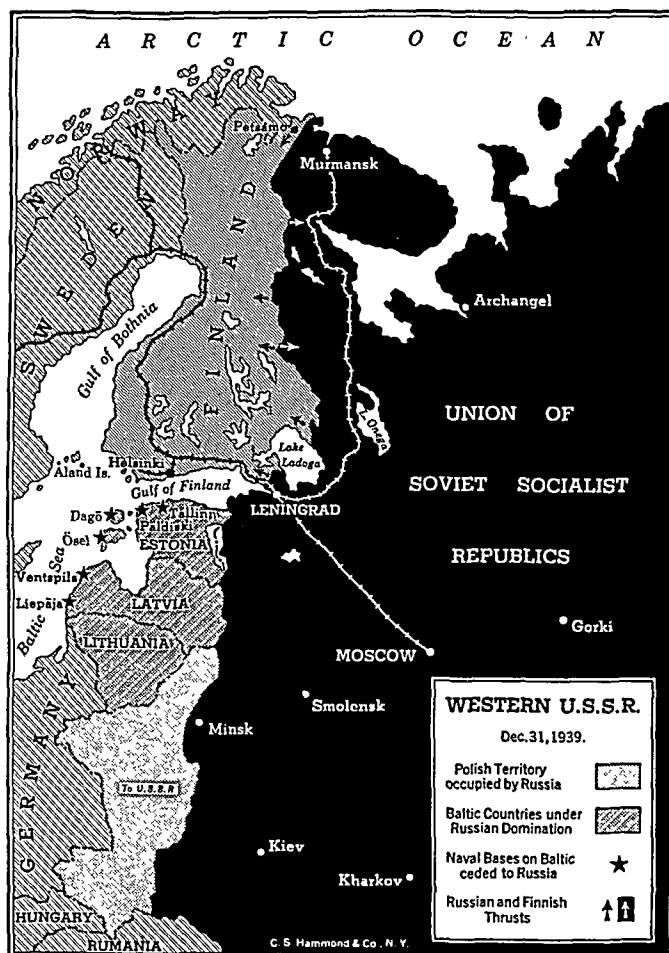
Uniform State Laws: see CONFERENCE OF COMMISSIONERS ON UNIFORM STATE LAWS.

"Union Now": see DEMOCRACY; PACIFISM.

Union of South Africa: see SOUTH AFRICA, THE UNION OF.

Union of Soviet Socialist Republics.

Area (exc. Western Ukraine and Western White Russia): 8,167,599 sq. mi.; pop. in 1939: 170,467,186; including Western Ukraine and Western White Russia, 185,809,012. In 1926, Russians were about 53% of the population; Ukrainians, 21.2%; White Russians, 3.2%; Kazakhs, 2.7%; Uzbeks, 2.6%; Tatars, 1.9%; Jews, 1.7%; Georgians, 1.2%. The social composition in 1937 was: workers and employees, 34.7%; collectivized peasants and co-operative craftsmen, 55.5%; individual peasants (other than Kulaks) and crafts-



men, 5.6%; other sections of population (students, army, pensioners, etc.), 4.2%. In language, the population of the U.S.S.R. belongs to the following groups: Indo-European, Caucasian, Semitic, Finno-Ugrian, Samoyede, Turkish, Mongol, Tungu, Palaeo-Asiatic and the Far Eastern civilized languages (Chinese, Japanese, etc.). 141 languages are spoken in the U.S.S.R. Cities of over 500,000 (1939) are: Moscow, 4,137,018; Leningrad, 3,191,304; Kiev, 846,293; Kharkov, 833,432; Baku, 809,347; Gorki, 644,116; Odessa, 604,223; Tashkent, 585,005; Tiflis, 519,175; Rostov-on-Don, 510,253; Dnepropetrovsk, 500,662.

History.—On Jan. 30, 1939, there was published the outline of a third Five-Year Plan, covering the years 1938-42, the chief aim of which was to achieve self-sufficiency in the basic heavy industries and the production of munitions. The plan calls for a yearly increase of 13.5% in industrial production, for the creation of coal and oil reserves and for the doubling of electrical energy. M. Molotov, speaking to the 18th congress of the Communist Party on March 16, foretold the necessity for two or three further Five-Year Plans, and expressed the opinion that by the end of 1942 the volume of industry would be increased by 88% and that the oil fields between the Volga and the Urals—"the second Baku"—would be producing 7,000,000 tons of oil per annum.

By terms of a new labour code, which came into force on January 15, each worker was provided with a "labour card" showing particulars of his employment and the reasons for any change of or dismissal from employment, etc., and without which no one could be employed at one place for more than five days; further, a month's warning had to be given by any worker wishing to change his place of employment. On May 28 measures were announced "to protect the common land of the collective farms from waste": limiting the amount of land permitted to collective

farmers for their own use, and raising the minimum number of days for work on the collective farms; and providing for the size of each collective farm to be determined.

Regulations were made governing the payment of machine tractor stations for their services to the collective farms; and decrees were issued on surveying the land in individual holdings.

The Far East.—In January Russia and Japan mutually accused each other of violating the spirit of the Portsmouth Treaty (1905), as a result of the Soviet Government's declared intention of letting the Far Eastern fishing grounds by tender or auction on March 15. Japan objected that Russia was making a political problem of the fishery question, and Russia replied that, in view of Japan's general policy toward her, she had to take precautions to guard her frontiers. In February it was stated that, if negotiations failed, Japan would take steps to maintain her rights. An agreement was signed on April 2 whereby the existing fisheries agreement of 1928 was extended until December: Japan paying 10% higher rental for 27 less fishing sections than she had in 1938, and Russia reserving 37 sections for strategic reasons.

During June and July the question of Japan's conduct of her oil and coal concessions in Northern Sakhalin caused some dispute. A Japanese protest against the imposition of a 374,000-rouble fine on a Japanese coal mining company was rejected by the Soviet Government, who contended that Russian employees were neither housed nor working under the conditions agreed upon in 1922 between the two Governments. On August 12 an agreement was reached whereby the Soviet employees of the Japanese-owned Northern Sakhalin Petroleum Co. should receive a 15% wage increase and the company might import 480 Japanese workers.

There was a continuance of border clashes between Soviet and Outer Mongolian troops and aircraft on the one hand, and Japanese-Manchoukuo forces on the other. Early in 1939 there were mutual recriminations regarding a Japanese landing on an island in the Argun river, and a reported crossing of the Manchoukuo frontier by Russian troops; and there was some local fighting. There was also intermittent air fighting from May onward from out of Outer Mongolia and Manchoukuo, accompanied by some infantry fighting, the most serious being occasioned by the reported crossing of the Outer Mongolian frontier south-east of Lake Buir by Japanese and Manchoukuo troops in July. On September 16 an armistice was signed in Moscow providing for the immediate cessation of hostilities and for the setting up of a mixed commission to demarcate the frontier; and on November 20 it was announced that an agreement had been reached by this commission.

Central and Northern Europe.—During 1939, the Soviet Union was wooed simultaneously by Germany and the Western democracies, and her final choice came as a surprise to practically the whole world. On February 2 Russia severed her diplomatic relations with Hungary, owing to that country's adherence to the anti-Comintern pact; and this certainly did not presage any amelioration of her relations with Germany. M. Stalin's speech to the congress of the Communist Party in March indicated fear of the "aggressive States" (chief among which he placed Germany) and distrust of the policy and intentions of the "non-aggressive States" (Great Britain, France and the U.S.A.); the latter, he said, had encouraged the aggressor by repudiating the policy of collective security, allowing Germany a free hand in central Europe and so pushing her further eastward. The note handed by M. Litvinov to the German ambassador on March 19, after the annexation of Czecho-Slovakia, was uncompromising in its condemnation of that action; and at about the same date the Soviet Government, in reply to a British enquiry concerning the Russian attitude in the event of an unprovoked attack on Rumania, proposed an international conference to consider the question of German aggression—a proposal rejected by the British Government as being pre-

Agriculture (1937)
Yield in Centners:

	Population (1939) (000's omitted)	Sown Area (hectares)	Grain (million cent.)	Flax	Sugar Beet	Cotton	Potatoes (million cent.)	Horn Cattle	Pigs	Sheep and Goats	Horses
R.S.F.S.R.	109,279	93,422,400	874.7	4,649,500	64,903,000	1,211,800	458	31,527,900	14,569,700	42,005,000	10,680,700
Ukrainian S.S.R.	39,000*	25,124,900	227.7	..	1,148,000	1,148,000	119	7,759,400	7,729,700	3,301,500	2,937,200
White Russian S.S.R.	10,368†	3,514,800	18.2	714,300	..	..	70	1,905,300	1,957,000	1,007,300	633,000
Azerbaijan S.S.R.	3,210	1,097,900	7.9	..	..	2,080,000	..	1,555,400	120,500	2,439,200	109,400
Georgian S.S.R.	3,542	1,003,500	10	..	1,044,000	..	..	1,754,900	684,000	1,954,200	168,200
Armenian S.S.R.	1,282	436,600	3.6	..	..	216,000	..	711,500	82,200	1,197,500	53,600
Turkmen S.S.R.	1,254	393,900	1.9	..	1,848,000	..	..	233,300	22,700	1,830,900	64,100
Uzbek S.S.R.	6,282	2,653,600	9.8	..	15,279,000	..	..	1,410,900	76,300	3,980,200	381,400
Tajik S.S.R.	1,485	767,000	4.8	..	1,742,000	..	..	500,100	21,000	1,634,900	102,200
Kazakh S.S.R.	6,146	5,831,800	30.6	..	3,039,000	1,248,000	..	3,005,400	367,900	5,287,800	638,700
Kirghiz S.S.R.	1,459	1,046,700	7.3	..	4,468,000	950,000	..	486,000	91,000	1,886,100	361,600

*Including the occupied Western Ukraine.

†Including the occupied White Russia.

mature.

The news, announced on May 3, that M. Litvinov had been released from the office of foreign commissar, which he had occupied since 1930, and that he had been succeeded, not by the assistant commissar, M. Potemkin, but by M. Molotov himself, gave rise to much speculation abroad as to the future course of Russia's European policy.

In a speech by M. Molotov to the Supreme Council on May 31, it became, however, increasingly evident that Soviet policy hinged on the specific question of guarantees to be given to the three countries on her north-west frontier, namely, Finland, Estonia and Latvia. The Russian demands were amplified in a reply on June 2 to further British and French proposals received on May 27, and five days later *Pravda* published the four minimum conditions required by them for a defensive organization, namely, (1) Conclusion of an agreement by the three countries for effective mutual assistance against aggression; (2) An agreement for the U.S.S.R. to give assistance to States guaranteed by Britain and France particularly Belgium, Greece, Rumania, Turkey and Poland in case they were attacked; (3) A guarantee by the three countries to assist the three Baltic States should their neutrality be violated; (4) A concrete agreement about the methods, the form and the extent of help to be given. The importance of the guarantee for the Baltic States was again urgently stressed on the grounds that an attack by Germany through these countries would be more dangerous than an attack through Poland and Rumania, which were already guaranteed by Great Britain and France. The difficulty lay in the fact that the Baltic States themselves had refused such a guarantee, which they felt would compromise the strict neutrality they desired, and both Britain and France declared it to be manifestly impossible to impose a guarantee on States not desiring it.

In the meantime it had been arranged that a British and French military mission should visit Moscow and it was proposed, concurrently with military conversations, to hold political discussions with a view to reaching a final conclusion. The mission arrived three days after Mr. Strang had left and staff talks began on August 12, and were resumed, after a break of three days, on August 21 (the day on which Herr von Ribbentrop announced the conclusion of the Russo-German pact), but still no satisfactory conclusion was reached. On August 27 Marshal Voroshilov presented the Soviet explanation of the failure. To give effective aid to Poland, Soviet troops would have to enter Polish territory, but the Anglo-French mission did not agree with this, and the Polish Government refused to accept assistance from the U.S.S.R. That, he declared, made military co-operation between Russia and the Powers impossible. Shortly afterward the Allied military missions returned to England.

The Russo-German pact of non-aggression was signed in Moscow on August 24 and ratified by the Supreme Council on August 31. (See also COMMUNISM; FRANCE; GREAT BRITAIN.)

The terms of the pact were briefly as follows: the two countries agreed not to attack each other, either independently or in conjunction with other powers; not to support any third power which might attack the other party to the pact; to remain in consultation with each other upon questions touching their common interests; not to join any group of powers directly or indirectly threatening one of the two parties; to solve all differences between the two by negotiation or arbitration. The pact was to last for ten years, with automatic extension for another five years unless either party gives notice to terminate it one year before its expiration.

Among the multitudinous and far-reaching effects of the pact with Germany the most immediately important, from Russia's point of view, were the removal of the fear of German penetration into the Ukraine, and the absorption into the Soviet Union (whether or not in accordance with a prearranged agreement with Germany) of a great portion of Poland. The Soviet view was that Russia could not remain inactive in face of the rapid collapse of Poland before the overwhelming German invasion; and that since there was now no question of helping Poland against Germany, Russia's only course in her own interests was to march into Poland from the east, and by so doing set a limit to Germany's eastward expansion while extending her own influence westward into Europe. On September 16 M. Molotov handed the Polish ambassador a note to the effect that Soviet troops were about to enter Polish territory—a note which the ambassador refused to accept, although he informed his Government of its contents. On the following day Russian troops entered Poland, and M. Molotov broadcast to the nation the reasons claimed for this action. The Polish State and its Government, he said, had virtually ceased to exist, and consequently all treaties between the Soviet Union and that country were void. The Soviet Government could not remain indifferent to the fate of its blood brothers, the Ukrainians and White Russians inhabiting Poland, and the Red army had crossed the frontier to take under its protection the lives and property of the populations of Western Ukraine and Western White Russia, and to deliver the Polish people from the war into which their unwise leaders had plunged them.

As a result of the treaty signed with Germany on September 29 for the partition of Poland, Russia acquired the provinces of Vilna

 Industry (Output 1937)
(in tons, 000's omitted)

	Coal	Iron Ore	Pig Iron	Steel	Manganese Ore	Peat	Oil & Gas	Electric Power in Kwh. (000,000's omitted)	Retail Trade (Turn-over 1938) (millions of roubles)
R.S.F.S.R.	52,021	11,356	5,687	9,234	..	19,860	..	23,787	95,851
Ukrainian S.S.R.	69,072	16,414	8,801	8,407	957	1,507	..	9,343	22,660
White Russian S.S.R.	..	..	..	3	..	2,445	..	430	3,328
Azerbaijan S.S.R.	..	..	..	18	..	..	23,226	1,391	2,597
Georgian S.S.R.	400	..	..	..	1,650	..	..	504	2,738
Armenian S.S.R.	..	..	..	..	..	3	..	265	821
Turkmen S.S.R.	..	..	..	..	..	..	452	57	1,053
Uzbek S.S.R.	..	..	..	8,000	..	1	365	276	4,561
Tajik S.S.R.	..	..	..	..	..	..	28	28	838
Kazakh S.S.R.	4,203	..	..	..	..	..	493	288	3,411
Kirghiz S.S.R.	806	..	..	..	..	5	..	29	716



NEW FRIENDS OF 1939: German Foreign Minister von Ribbentrop, Joseph Stalin, and Premier-Foreign Minister Molotov of Russia just after the signature of the Nazi-Soviet pact of non-aggression early in the morning of Aug. 24, 1939, at Moscow

(but on October 10 the city and district of Vilna were ceded to Lithuania), Nowogrodek, Polesia, Volhynia, Tarnopol and Stanislawow, nearly the whole of the province of Bialystok and the eastern part of the province of Lwow—very roughly, that is, five-eighths of the area and half the population of Poland. (See also EUROPEAN WAR; POLAND.)

Neither Russia's pact with Germany nor her occupation of Poland modified the Soviet Government's assertion of technical neutrality in the European war between Germany and the Western democracies; although, after the conclusion of the treaty of friendship on September 29, Russia and Germany jointly declared that they would consider Great Britain and France responsible for any continuation of the war, for which there no longer existed any reason, and that they would consult together regarding the measures to be taken if the war were continued. Against this, however, it may be recorded that, in its manifesto issued on the occasion of the anniversary of the Revolution on November 6, the Comintern accused Germany, equally with Great Britain and France, of conducting a war for world domination. The German-Soviet treaty of friendship finally demarcated the Russo-German boundary in Poland; and it provided for the drawing up of an economic program according to which the Soviet Union would furnish raw materials to Germany which would be counterbalanced by Germany by means of deliveries of industrial products to be made in the course of a longer period. With the Polish question settled, the Soviet Government was free to devote its attention to a matter which for long had been the object of its earnest consideration, namely, its relations with the three Baltic States and Finland.

Frontier incidents were alleged by Soviet Russia, culminating in the action of Finnish artillery, reported by Moscow on November 26 but denied by Finland, and causing casualties among the Soviet troops in the Karelian isthmus. M. Molotov thereupon handed the Finnish ambassador a note demanding the withdrawal of Finnish troops 12 to 15 miles from the frontier. On November 28 the Soviet Government denounced the treaty of non-aggression with Finland which had been signed in 1932, on the ground that the concentration of Finnish troops in the neighbourhood of Leningrad was inconsistent with the treaty. Relations between the Soviet Union and Finland were broken off on November 29, and on the 30th Russian troops invaded Finland. (See also ESTONIA; EURO-

PEAN WAR: *Russian Campaign in Finland*; FINLAND; LATVIA; LEAGUE OF NATIONS; LITHUANIA.)

Turkey and the Balkans.—From April 29 to May 5 M. Potemkin, assistant commissar of foreign affairs, was in Turkey on a special mission, as a result of which it was announced in Turkey that the Turkish and Soviet Governments would "pursue their parallel efforts for safeguarding peace and security and would continue to keep in constant touch in order to exchange political information bearing upon their common interests." From September 25 to October 17 the Turkish foreign minister, M. Sarajoglu, held intermittent conversations in Moscow with MM. Stalin and Molotov in an effort to examine and define these "common interests," but the Soviet Government could not persuade Turkey that the proposed Russo-Turkey treaty was reconcilable with the Anglo-French-Turkish pact, and the negotiations were abortive. On November 14 the Soviet press, which had welcomed the Anglo-Turkish pact on its first announcement in May, accused Great Britain and France of using the pact as a means for exerting pressure upon the Balkans. On his way back from Turkey in May M. Potemkin also visited Sofia and Bucharest; and on May 8 it was reported from Bucharest that the Soviet Government had made offers of defensive guarantees to the small Eastern European States. On September 17, the day on which Soviet troops entered Poland, the Government gave Rumania an assurance that Russia would respect her neutrality. (See also BALKAN ENTENTE; BULGARIA; HUNGARY; ITALY; RUMANIA; TURKEY; YUGOSLAVIA.) (X.)

Cultural Life.—Pupils (elementary and secondary schools) (1938-39), 31,517,400; higher educational institutions (1938-39), 709; students, 602,900; libraries (1938), c. 70,000, with 126,600,000 books; teachers (1937), 969,000; agriculturists (1937), c. 80,000; newspapers (1937), 8,521, in 36,200,000 copies; printed books (1937), 673,500,000 copies.

Banking and Finance.—National income (1938) at 1926-27 prices, 105 milliard roubles; capital investments in national economy (1935-37), 155.4 million million roubles. Revenue (1938), 156,097,829,000 roubles; expenditure (1938), 155,447,829,000 roubles. State bank (1938): 3,300 branch banks and agencies with about 100,000 employees; granted credit to industry (1938) of 475,000,000,000 roubles; total turn-over of the bank (1938), 2,743,000,000,000 roubles.

Trade and Industry.—Gross retail trade turn-over (1938) at 1926-27 prices: 138,574.3 million roubles. Foreign trade (Jan.-Dec. 1938): total export, 1,831,927,000 roubles; total import, 1,422,882,000 roubles. Main exports to Great Britain, 375,124,000 roubles; to Belgium-Luxemburg, 116,803,000 roubles; to U.S.A., 96,749,000 roubles. Main imports from U.S.A., 405,858,000 roubles; from Great Britain, 240,309,000 roubles; from Holland, 102,535,000 roubles.

American-Soviet trade (1938): exports to the U.S.S.R., \$69,691,000, mainly machinery exports valued at \$35,050,000; imports from U.S.S.R., \$23,532,000, mainly furs \$12,127,000, manganese ore \$2,662,000, anthracite \$1,125,000. Anglo-Soviet trade (1938): exports to the U.S.S.R., £6,433,573 (Jan.-May 1939, £2,954,234), mainly machinery £3,353,000, non-ferrous metals £1,329,000, woollen rags £390,000, iron and steel £326,000, vehicles £122,000; imports from the U.S.S.R., £19,543,030 (Jan.-May 1939, £2,932,110), mainly wood and timber £6,316,000, grain £4,187,000, furs £3,630,000, petroleum £1,415,000, canned salmon £1,183,000; re-exports to the U.S.S.R., £10,985,945 (Jan.-May 1939, £2,129,018), mainly non-ferrous metals £7,783,000, rubber £1,056,000, wool £995,000, tea £553,000.

Industry (1938): output of coal, 132.9 million tons; iron ore, 26.5 million tons; pig iron, 14.7 million tons; steel, 18 million tons; manganese ore, 2,272.8 thousand tons; oil, 32.2 million tons;

peat 26.5 million tons; electric power, 39.6 milliard kwh.; whole industrial production (at prices 1926-27), 106.1 milliard roubles.

Transport.—(1938) Length of railways 85,000km. (1,000km. electrified); passengers carried, 1,177.8 million; goods, 516.7 million tons; length of inland waterways, 90,600km.; passengers carried, 68.1 million; goods (1937), 66.9 million tons; freight carried by sea, 30.4 million tons; passengers, 3.1 million; length of air lines (1939), 116,000km.; passengers carried, 292,700; freight, 45,500 tons; mail, 10,700 tons.

Agriculture.—In 1938: collective farms, 242,000, embracing 18,842,900 peasant homesteads; State farms, 3,961; individual peasant homesteads, 1,309,900; machine tractor stations (1939), 6,358; tractors, 483,500; total sown area, 136,900,000ha., including grains 102,400,000ha., industrial plants 11,000,000ha., vegetables, 9,400,000ha., feed-grasses 14,100,000 hectares. Sown area of collective farms, 117,200,000ha.; State farms, 12,411,000 hectares. Yield of grain crops, 854,900,000 quintals; fibre flax, 5,460,000 quintals; raw cotton, 26,900,000 quintals; sugar beet, 166,800,000 quintals; potatoes, 419,600,000 quintals. Agricultural production (1937) at 1926-27 prices, 15,069.5 million roubles; livestock production (1937) at 1926-27 prices, 5,053.5 million roubles. Horn cattle, 63,200,000; pigs, 30,600,000; sheep and goats, 102,500,000; horses, 17,500,000. (See also FASCISM; JAPAN; PROPAGANDA; RELIGION; UNITED STATES: *Roosevelt and the Dictators*.) (S. YAK.)

Unitarian Church. Chief among the activities of the American Unitarian church during the year 1939 was the relief mission sent to Czecho-Slovakia in co-operation with the American Friends Service Committee, to administer the funds raised by the American Committee for Relief in Czecho-Slovakia. The Rev. and Mrs. Waitstill H. Sharp of Wellesley Hills, Massachusetts, were sent early in February and remained until September. The Rev. Duncan Howlett of New Bedford, Massachusetts was also sent to make a survey of Czech refugee needs in Poland. The outbreak of the war made impossible any immediate work in that area—but the commission reorganized itself to be prepared to raise additional funds and supply personnel for European relief missions as soon as opportunities were opened.

Because of the outbreak of the war in Europe, plans for the next International Association Congress to be held in Budapest, Hungary were cancelled.

The biennial conference of the American Unitarian Association was held in San Francisco, Aug. 24-27, 1939. The principal speakers were the Hon. Sanford Bates, moderator of the American Unitarian Association, and Dr. Alice Garrigue Masaryk, daughter of the founder-president of Czechoslovakia.

Under the extension program, two new churches—in Fort Wayne, Ind. and in Grosse Pointe, Mich.—were organized, and three others were admitted to the association. The regional organization of the association was strengthened by the development of the Southern New England Council of Unitarian Churches and by a former vice-president of the association assuming the directorship of the South-Western area with headquarters in Tulsa, Oklahoma.

Under the direction of a newly organized Department of Promotion and Publicity, a national radio program was instituted originating over a Boston station and released by electrical transcription in the South, Mid-West and Pacific Coast. The same program was also released on a weekly world-wide short wave broadcast. The year 1939 marked the 400th anniversary of the birth in Siena, Italy of Faustus Socinus, leader of the Unitarians in the Reformation period, whose influence spread throughout Europe, especially in Poland.

There was peculiar significance to the celebration of this anniversary in the churches. (J. H. L.)

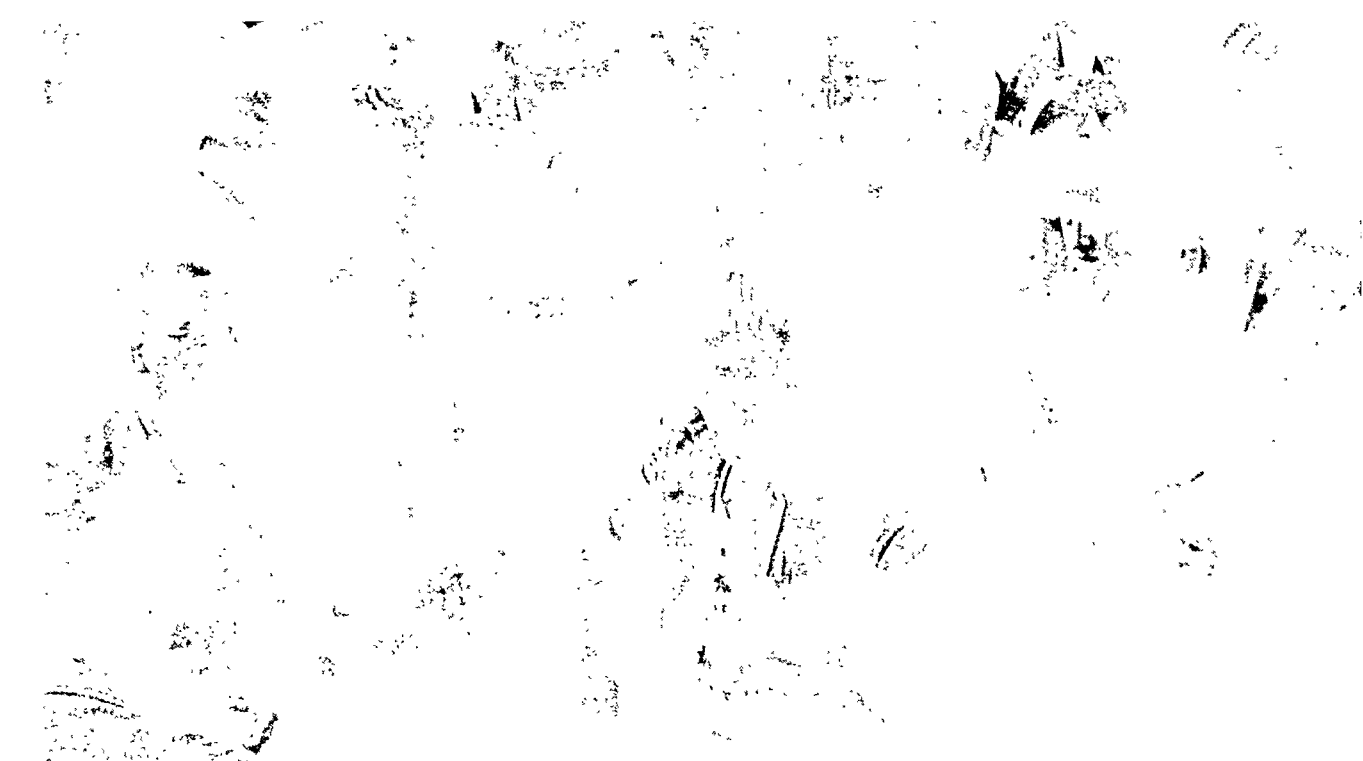
United Kingdom: see GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

United States. The United States Bureau of the Census estimated the number of inhabitants on July 1, 1938, at 130,215,000 (later estimates were discontinued until after the 1940 census). This marked an increase of 958,000 over July 1, 1937, and of 7,440,000 over the 1930 census. Population figures for individual States may be found in the separate State articles. See also the articles BIRTH STATISTICS; CHURCH MEMBERSHIP; DEATH STATISTICS; EDUCATION; ILLITERACY; INDIANS, AMERICAN; NEGROES (AMERICAN); POPULATION, MOVEMENTS OF and UNIVERSITIES AND COLLEGES for statistical information of social conditions. (X.)

History.—While domestic problems like relief, labour, housing, agriculture, party politics and the third term issue continued to occupy attention during the year 1939, they were overshadowed to an extent not equalled since the days of the World War (1914-18) by the precarious state of European peace. The "appeasement" policy at Munich, in Sept. 1938, after Hitler had absorbed Austria, did not deter him from forcibly annexing the Sudetenland and reducing Czechoslovakia to a virtually vassal State. As the year 1939 progressed his demands on Poland to yield Danzig and the Corridor culminated in September in a ruthless invasion of Poland (after an astonishing alliance between Nazi Germany and Communist Russia) and the rapid extermination of that unhappy State, now partitioned, for the fourth time, between its powerful neighbours. The Polish invasion brought Great Britain and France into the lists against Germany, thus starting the European war. The closing weeks of the year saw Russia, taking a leaf from Hitler's book of aggression and roused by the Polish booty to dreams of westward expansion, demanding by arms the virtual reduction of Finland to puppet state and threatening the security of Finland's neighbours, Sweden and Norway, across the Baltic. Faced thus with actual war in Europe and with the uncertainty as to whether this war would eventually draw the United States into its orbit, as the war of 1914-18 had done, the U.S. Government and people quite naturally grew more and more interested in the political, diplomatic and commercial policies which should conduce to the preservation of neutrality and at the same time not isolate the U.S. in sympathy from the European nations that were fighting against the wanton aggressions and international bad faith of the totalitarian despots.

QUEEN ELIZABETH and Mrs. Roosevelt took a short sight-seeing tour June 8, 1939, during the British monarch's visit to Washington





BY A PORTABLE RADIO installed on the steps of the U.S. Capitol, these Americans, like millions of others, listened to Pres. Roosevelt's speech Sept. 21, 1939, in which he urged Congress to revise the U.S. Neutrality Act.

Business conditions improved during the year 1939, but not so rapidly as had been predicted at the opening of the year. Autumn saw an approach to the high levels of 1936. Steel production was up 20% to nearly capacity. Electric power production was at its height. Chain stores registered increasing business. Automobile manufacturers were planning the biggest year since 1933. The Federal Reserve Board's official index of Dec. 9, 1939, showed an industrial production figure of 125 as contrasted with 119 in 1929, based on the averages of 1923-25. The increase of 5% in the month of November alone doubtless represented the anticipation of a great boom in war orders (especially aeroplanes) which may or may not materialize. At any rate, the scarcity of new legislation for the regulation of business and the relative moderation of the administration in exercising the control which certain elements of big business have called persecution have encouraged private industry to grapple more confidently with the problems which have retarded the economic recovery which the vast resources in man power and materials ought to guarantee.

Congress.—The first session of the 76th Congress, which convened on Jan. 3, 1939, showed the decided gains which the Republicans had made in the mid-term elections of the previous November. The Democratic representation in the House was reduced from 346 seats in the 75th Congress to 262, while the Republicans increased from 89 to 169. In the Senate a gain of seven seats raised the Republican representation from 16 to 23. Though the Democrats still had very large majorities in both houses, dissatisfaction in their ranks with some of the major policies of the administration (such as relief, the continually growing deficits, certain clauses in the Social Security Act and the Wages and Hours Act, and the administration of the National Labor Relations Board) enabled a combination of these dissatisfied elements with the Republicans to stymie the President's plans. In none of the previous Congresses of the Roosevelt administration had there been shown so strong a spirit of independence of the will of the President, so ready a disposition even among his own fol-

lowers to criticize or amend the laws which they had passed so readily at his bidding. The session lasted from January 3 to August 5, and its debates fill 12,000 pages of the *Congressional Record*. But, unlike the previous sessions, it passed no new major laws. Indeed, the President said in his opening address that the program of the New Deal was virtually completed: "We have moved upon deep-seated problems affecting our national strength and have forged national instruments adequate to meet them." He confessed that some of these instruments had to be roughly shaped and needed machining down. He had no objection to this process, provided that the "basic principles of the New Deal" were retained. But the "machining down" often bit pretty deeply into the metal. For example, a spending-lending (nicknamed "splending") bill advocated by the President as an aid to business was ruthlessly thrown out by the House, as was a bill permitting the United States Housing Authority to loan \$800,000,000 to States and cities for slum clearance and the construction of low-cost dwellings. The President asked for \$875,000,000 to continue the relief work of the WPA until the end of the fiscal year (June 30, 1939), but Congress cut the figure down by \$50,000,000. His request for \$1,755,000,000 for the same work for the year 1939-40 was granted, but Congress accompanied the grant with provisions designed to prevent relief from becoming a "career." WPA workers might not remain on the rolls for more than 18 consecutive months, and a minimum of 130 work hours a month was prescribed. Relief to certain classes of "white-collar" workers was cut down. The Hatch Act, passed in July, aimed at taking politics out of relief by making it unlawful, under a penalty of \$1,000 fine or a year's imprisonment, for anyone to solicit from persons on relief "any assessment, subscription, or contribution for any political purpose." Such changes as were made in the revenue laws were favourable to business. No increase was made in the income tax rates, while the capital gains tax was reduced and the surplus profits tax eliminated. The President's persistent plea for the repeal of the arms embargo in the Neutrality Act of 1937 was rejected by the close vote of 12 to 11 in the Senate Committee on Foreign Relations (July 11) after a long and bitter debate.

On the other hand, Congress unhesitatingly granted the President's request for the strengthening of national defences, appropriating \$1,700,000,000 for the military, naval and air forces, the largest peacetime defence budget in U.S. history; and its appropriation of \$1,194,000,000 for agricultural relief actually exceeded the President's recommendation by some \$300,000,000—a rare phenomenon. On May 1 Congress passed the Reorganization Bill (defeated the previous year) authorizing the President to make sweeping changes and consolidations in the various Federal boards, commissions and authorities, by which he gathered 17 independent and often overlapping administrations into three: the Federal Loan Agency under Jesse Jones, the Federal Works Agency under John Carmody, and the Federal Security Agency under Paul V. McNutt. These three men, though not of cabinet rank, were invited frequently by the President to sit with the cabinet. Altogether, the appropriations for the fiscal year 1939-40 were \$13,000,000,000, an increase of \$2,000,000,000 over the previous year and the largest since the World War.

With the outbreak of the European war at the beginning of September, the President, convinced that the arms embargo threatened rather than guaranteed the neutrality of the United States, called Congress in extra session on September 21 to urge again the repeal of the embargo. Calling attention to the unsuccessful efforts which the U.S. Government had made to prevent the outbreak of "the present appalling war," he declared that the U.S. must lose no time or effort to keep the nation from being drawn into it. He assumed that every member of Congress and the executive departments was "without reservation in favour of such measures" as would protect American neutrality. The only question was what measures were best calculated to accomplish that end. His plea was for a return to the "traditional and historic American policy" of reliance on international law, which put the land powers and the sea powers on the same footing, and the end of the embargo which penalized the sea powers and was therefore unneutral. He would surround the new policy (or rather the old policy which had been abandoned in 1937) with certain safeguards, such as the closing of danger zones to American merchant vessels, the prevention of American citizens from travelling on belligerent ships, the "cash-and-carry" provision of the former law and the denial of war credits to belligerent nations. He saw no reason for other than the revised neutrality legislation in this extra session, and asked the leaders of the two major parties in Congress to remain in Washington for consultation and advice until the meeting of the next regular session in Jan. 1940. After a spirited de-

bate, the Senate, by the unexpectedly large majority of 63 to 30, repealed the arms embargo on October 27, Senator La Follette losing his amendment for a popular referendum on the declaration of war by 17 to 73. The House, on November 2, supported the repeal, and the extra session immediately came to an end. (See also NEUTRALITY.)

The Budget.—No progress was made during the year 1939 toward balancing the Federal budget. On the contrary, the expenses for the fiscal year (\$9,250,000,000) exceeded the receipts (\$5,670,000,000) by \$3,580,000,000, marking the ninth successive year of deficits and bringing the national debt up to \$41,500,000,000. The President's budget message of Jan. 1939, called for expenditures of some \$9,000,000,000 for the fiscal year ending June 30, 1940, with estimated receipts of \$5,700,000,000. The addition of three-and-a-third billions to the national debt would bring the figure up to the very edge of the debt limit of \$45,000,000,000 fixed by act of Congress. The constant demand of the opponents of the administration (and, indeed, of many of its friends) that at least a beginning shall be made toward balancing the budget meets with arguments both theoretical and practical as to why the spending should go on. The President expressed his conviction that the continued "pump priming" will revive business and raise the national income to at least \$80,000,000,000, when the increased tax revenues will suffice to wipe out the deficit. This, notwithstanding the fact that the national income declined by about 9% in the last fiscal year and unemployment continued around the 10,000,000 mark. Furthermore, the administration asks as a practical question what items of present expense could be cut down. The fixed charges for running the Government and servicing the public debt must be met. The national defence program must be enlarged not curtailed. Relief must be continued. If, then, the reduction of expenses is impracticable, there remains only the hope for increased revenues through taxation. But, with a presidential year approaching, neither a Democratic administration which hopes for a renewal of power nor Senators and Congressmen who look forward to re-election will be keen to assess new taxes. The balancing of the budget begins to look like as hopeless a problem as the squaring of the circle. (See also BUDGET.)

The Farm Problem.—Though the elaborate Agricultural Adjustment Act of 1938, aiming at the attainment of an "ever normal granary" and providing for plebiscites among the farmers of specified crops on the adoption of quotas, was not altered during the year 1939, there was nevertheless much discussion over the ways and means of making the act effective, and there were many plans proposed for further improvement of the farmers' status. It was

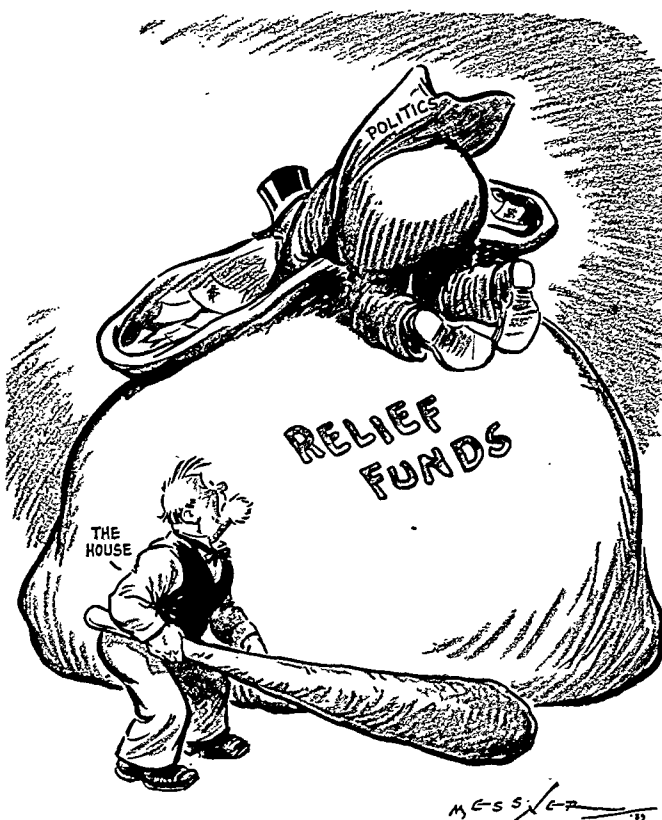
A RIOT OF WPA WORKERS, during which a policeman died, was staged in Minneapolis July 10, 1939, as part of a national strike against longer working hours



evident that this grave problem was far from being solved, and that the agricultural situation would be an important issue in the campaign of 1940. On Dec. 19, 1939, the Department of Agriculture estimated the total farm income for the year at \$7,625,000,000, as compared with \$7,632,000,000 for the previous year and with \$10,479,000,000 for the year 1929. On the other hand, while the appropriations of the department were only \$166,000,000 in 1929, they had risen a decade later to the huge sum of \$1,213,400,000. Government payments to farmers during 1939 reached \$675,000,000, or an average of \$97 a farm. Thus while the farmers' cash income increased by about 60% since the depression year of 1932, the Federal outlay for farm relief grew by 312%. In spite of such large expenditures (which led the President in a statement, of Dec. 19, 1939, to declare that the coming session of Congress should provide new taxes for the agricultural deficits), the problem of undisposed surpluses of farm products remained unsolved.

The cotton situation was especially acute. There were some 11,500,000 bales of cotton stored in barns and warehouses of the South, on which the Government has loaned \$600,000,000, or over \$50 a bale. Various plans have been proposed for disposing of this surplus, reminding one of the remedies proposed in the McNary-Haugen bills of a decade and more ago. For example, in 1938 a plan for the Government to set prices for the domestic sale of cotton and other farm products, determined by the U.S. cost of production, narrowly failed of passage in the Senate. Another scheme proposed was that farmers be allowed to buy back from the Government 3,000,000 bales of cotton at 5¢ a pound and sell it at the current market price of between 8¢ and 9¢. Senator Byrnes of South Carolina suggested bartering 2,000,000 bales of cotton and 100,000,000 bu. of wheat for supplies of rubber and tin, which the colonial possessions of Great Britain and the Netherlands have in abundance and which the U.S. might store against eventual needs—a policy diametrically opposed to Secretary Hull's anti-bilateral and anti-barter trade pacts. Finally, a conference of 10 cotton exporting countries has been proposed to find a way of stabilizing the cotton production and trade. None of these schemes, however, came to fruition in the Congress of 1939. About a week before the close of the first session in August, Senator Lee of Oklahoma got before the House Committee on Agriculture a bill to make \$350,000,000 available for 40-year loans at 3% to tenant farmers for the purchase of farms, including Government insurance of loans made by private agencies. This was to supplement and greatly enlarge the Bankhead-Jones Act of 1937 for the relief of tenant farmers, under which only \$35,000,000 had been loaned by the Farm Security Administration to some 8,000 out of several million tenants. Farm tenancy and share cropping, though the latter is somewhat diminishing, burdened over 40% of the farms of the country, with their 32,000,000 residents. It is no wonder that President Roosevelt has called the South, where most of this burden rests, "the country's number one economic problem."

A novel experiment was undertaken in 1939 in the distribution of food supplies to the people. Heretofore the Federal Surplus Commodities Corporation has purchased and distributed to the needy large quantities of foodstuffs gratis, much to the embarrassment of the retail food dealers. Beginning in Rochester, N.Y., and spreading to six other cities during the year, a new device was tried. The beneficiaries of relief were allowed to take part of their monthly payments in orange and blue stamps issued by the FSICC, the orange stamps being good for the purchase of food of any kind, and the blue stamps (of which the person received, as a kind of bonus, 50¢ worth for every dollar's worth of orange stamps he took) being good for the purchase of certain "enumerated" commodities of which a surplus existed. The grocer or



"WELL, WHAT ARE WE WAITING FOR?" This cartoon by Messner of *The Rochester Times-Union* appeared a few days before Congress passed the 1940 relief bill June 30, 1939

butcher who took these stamps in payment could turn them in at his bank as cash, and the Government reimbursed the banker. This scheme, which bids fair to spread further, has several advantages. It encourages the recipient of relief money to spend a larger share of it on the necessities of life; it permits the retail dealer to make his profit on the food sold; and it helps solve the anomalous situation of hungry people living in a land where food is spoiling.

Labour Problems; the A.F. of L. and the C.I.O.—In spite of repeated efforts by the President and by Secretary of Labor Perkins to bring peace between the A.F. of L. and the C.I.O., these rival factions in the labour union ranks continued their bitter fight all through the year 1939. In March the President summoned a conference to the White House (later adjourned to New York) to try to negotiate a "peace with honour" between the factions. But they proved to be only farther apart than ever. The original rift, resulting from the secession and expulsion of ten unions of the A.F. of L. in the autumn of 1935, and their consequent formation into the Committee for Industrial Organization under the vigorous president of the United Mine Workers of America, John L. Lewis, had been widened by the phenomenal success of the C.I.O. in forming new industrial unions, in detaching unions from the parent A.F. of L., in securing contracts with big business corporations, and by conflicting views on the rulings of the National Labor Relations Board. The A.F. of L., calling its rival communistic, complained the Board favoured it unduly. The C.I.O. supporting the Board, accused its rival of being "aristocratic," dictatorial and reactionary. The battle was further complicated in Feb. 1939, by a split in the ranks of the C.I.O. itself, when the United Automobile Workers of America, the second largest union in the organization, with some 400,000 members, staged a lively fight between the president, Homer Martin, and the majority of the officers of the union. All that came out of the conference of

March-April was a proposal by Mr. Lewis (promptly spurned by the A.F. of L.) that the A.F. of L., the C.I.O. and the railroad brotherhoods should be merged into an American Congress of Labor, to be governed by an executive board representing the three organizations, but on which neither he nor President Green of the A.F. of L. should serve. The annual conventions of the A.F. of L. and the C.I.O. (the former at Cincinnati on October 2, and the latter at San Francisco on October 9) were notable for the expression of mutual defiance, Mr. Lewis boasting that in five years the membership of the Congress of Industrial Organizations, as the C.I.O. had been renamed, would reach 10,000,000.

Strikes.—During the first seven months of 1939 the number of strikes reported by the department of labour averaged 192 a month, as compared with 231 a month in 1938 and 395 in the prosperous year of 1937. The most serious strike was in the bituminous coal field. On April 1 the contract of the United Mine Workers of America (C.I.O.) with the operators expired, and the latter refused to renew the contract on the terms which Mr. Lewis demanded: namely, the closed shop and the abolition of the "penalty clause." The former demand would oblige the companies to hire no workers but members of the U.M.W.A., and the latter demand was for the omission of the penalty of a dollar a day on every worker who participated in a strike without the sanction of the union. At Mr. Lewis' bidding 420,000 miners laid down their tools, and in May the shortage of coal became serious. Subway trains were cutting their schedules by 25%. After a struggle of six weeks, and in spite of the organization of a rival group, the Progressive Miners of America, affiliated with the A.F. of L., the United Mine Workers, who comprised over 90% of the bituminous miners, won a complete victory. Eighty per cent of the operators yielded to the demands of Mr. Lewis and signed a two years' contract. The most conspicuous hold-outs were the operators of Harlan, Kentucky, "bloody Harlan," where violence continued until Governor Chandler called out the State troops.

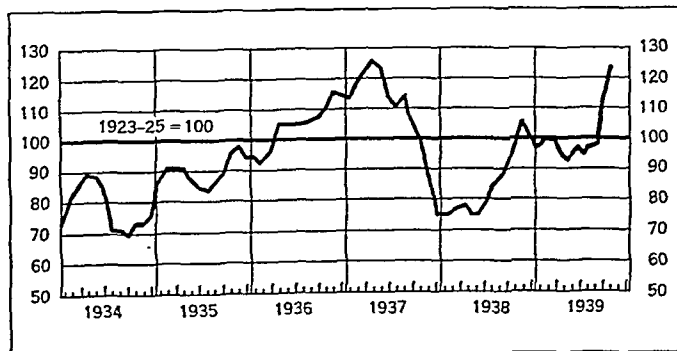
The longest strike of the year (54 days) began on October 6, when about 50,000 men in the plants of the Chrysler Automobile Corporation staged a "slow-down" strike patterned on the old "ca' canny" or slacking policies. The contract of the Corporation with the C.I.O. expired on September 30, and the workers demanded in a new contract a wage increase of 10¢ an hour, the closed shop, arbitration of disputes by a joint appeals board, and a voice in fixing production schedules. The strike was ended late in November by an agreement on the whole favourable to the company. A wage increase of 3¢ an hour was granted, as was the arbitration demand; but the union failed to get either the closed shop or a voice in determining the production schedules. Other strikes worthy of note during the year were one of a month's duration (July-August) by the tool and die workers of General Motors, which was settled to the advantage of the United Automobile Workers of America, and a strike of the International Longshore-

men's Association (A.F. of L.) in November, which tied up more than 70 passenger and freight vessels on the Atlantic seaboard.

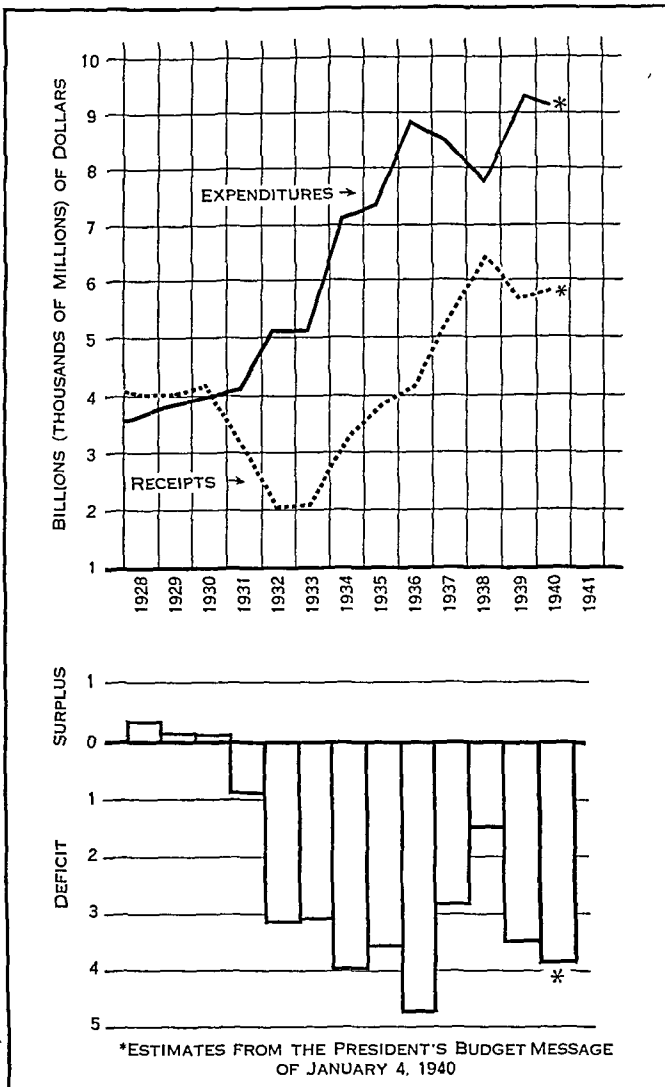
An unprecedented kind of strike was inaugurated in the mid-summer of 1939 when a number of skilled workers on the WPA rolls laid down their tools in protest against the revision of the WPA rules by act of Congress of July 1. The question was whether the skilled worker should receive the "prevailing" (union) wage as if he were employed in private industry, or merely a "security" wage as a beneficiary of Government aid. Before the change of July 1 a compromise had been in effect, satisfactory to the unions, by which a worker received the prevailing wage per hour but worked many fewer hours than the unskilled. So that the actual income of the skilled worker was far less than it would have been had he had steady employment in private industry. The new law required that all WPA workers should put in 130 hours a month, or five six-hour days per week, which, of course, reduced the hourly wage of the skilled worker far below the prevailing union wage; and the argument of the disgruntled workers was that the law would force down wages generally in the skilled industries. The administrator of the WPA, Colonel F. C. Harrington (who had succeeded Harry Hopkins when the latter took the place of Daniel C. Roper as Secretary of Commerce) refused to give any comfort to the strikers. When some 20,000 of the men failed to report to WPA headquarters for five days they were promptly mailed their "pink slips," or notices of dismissal. President Roosevelt, in words recalling Calvin Coolidge's rebuke to the striking Boston policemen, dismissed the matter curtly with the remark "You cannot strike against the Government." The WPA being a non-profit organization supported by the tax-payers, a strike in its ranks was little less than ridiculous. The head of the A.F. of L. did not support it, and sympathetic members of Congress, who had at first introduced bills to restore the "prevailing" wage, saw fit to let them die. Thus ended what the wits called the "mutiny on the bounty." (See also STRIKES AND LOCK-OUTS.)

The NLRB.—Dissatisfaction with both the National Labor Relations (Wagner) Act of 1935 (which allowed only labour to call for elections to determine which union should bargain with the employers) and the rulings of the National Labor Relations Board continued through the year 1939. The first of these complaints was remedied at the beginning of July, when the board announced that employers as well as workers would be permitted to call for an election. But the charges of unfair discrimination in favour of labour in the rulings of the board persisted. A break in favour of the employers came in March with a six to two decision of the Supreme Court (Justices Reed and Black dissenting) reversing the order of the board to the Fansteel Metallurgical company to re-hire men discharged in the sit-down strike of 1937. Chief-Justice Hughes in reading the opinion declared that the sit-down strike was "a high-handed proceeding without a shadow of legal right." So clamorous was the criticism of the NLRB by both employers and one faction of labour (the A.F. of L.) that the House, before the adjournment of Congress in August, appointed a committee of five to make an investigation of the board, with the purpose of possible changes in the National Labor Relations Act. The committee mailed tens of thousands of questionnaires to labour unions, employers, law professors and police chiefs, requesting information on the economic effects, the legality and the social consequences of the board's rulings. What effect the report may have on Congress and the presidential campaign of 1940 remains to be seen.

Labour and the Anti-trust Laws.—Meanwhile no little concern has been created in the ranks of labour by the activities of Thurman Arnold, lately law professor at Yale and author of *The Folklore of Capitalism*, who is assistant attorney-general in charge of the enforcement of the anti-trust laws. The Clayton Act of 1914,



MANUFACTURING PRODUCTION in the United States; Federal Reserve Board Index, without adjustment for seasonal variation



RECEIPTS (....) AND EXPENDITURES (—) of the Federal Government in fiscal years ended June 30; with surplus or deficit shown below. Receipts for 1940 include \$537,355,000 of net transfers to old-age reserve account

by its sixth and twentieth sections, seemed to exempt labour organizations from the penalties of those laws. But Mr. Arnold, in the zealous prosecution of his duties, listed a number of practices by the labour unions which he declares infractions of the law. Such are (1) preventing the use of cheaper materials or improved equipment for the sake of creating more jobs, (2) for the same purpose compelling firms to hire unnecessary workers, (3) combining with producers and distributors to fix illegal prices. He brought indictments against building trade unions in St. Louis, Detroit and Washington for violations of the anti-trust laws; and he was upheld by Attorney-General Murphy, who contended that "the policy of enforcement should not vary according to individual views of the official charged with enforcement." If Mr. Arnold draws the unions into the net of the anti-trust laws, one may question whether the Clayton Act will continue to be, in Gompers' words, "the Magna Carta of American labour."

Transportation. The Railroads.—The business recession of 1937-38, added to increased taxes and the competition of buses, pipe lines and water-borne traffic, led the railroads in the summer of 1938 to propose a reduction of 15% in wages, the ICC having refused to grant them the increase in freight rates which they asked. The threat of wage reduction was answered by counter-threat of a general strike on Dec. 1, 1938. Meanwhile a fact-finding committee created by the President reported (Oct. 1938) that,

compared to wages in other industries, the railway wages were not too high, and noted that the more prosperous railroads could well afford to pay the present wages. While not legally compelled to accept the report of the President's committee, the roads acquiesced and the strike was averted. It was recognized, however, that something must be done to help the railroads out of a slump which had sent the average price of their bonds down from \$95.59 in 1930 to \$55.92 in Aug. 1938, and their stock from \$91.56 to \$26.06 a share. But contrary to the predictions at the end of 1938, the 76th Congress took scarcely any notice of the railroad problem. Meanwhile an innovation in railroad travel was bringing in added revenues and bade fair to rescue the passenger traffic from the doldrums into which it had fallen since 1932. That innovation was the fast streamlined train, like the Burlington "Zephyr," the Santa Fe "El Capitan," the Rock Island "Rocket" and now more than 75 others, which, without increase in fares, are carrying thousands of passengers and making substantial earnings. An index of improving traffic conditions was a reduction in round-trip fares announced by the eastern roads in June 1939, which saved, for example, \$14.85 on a round-trip ticket from New York to Chicago. The rate in 1939 was a little less than 2¢ a mile, a figure against which the roads protested vigorously when it was imposed by the ICC three years before. (See also RAILROADS.)

The Merchant Marine.—With the establishment of the Maritime Commission in 1936, to replace the United States Shipping Board set up 20 years earlier as a war measure, the U.S. began seriously to tackle a problem of first rate importance for its foreign trade, commercial autonomy and the adequate supply of transports and personnel for the U.S. navy. Under the vigorous chairmanship of Joseph P. Kennedy (later ambassador to Great Britain) an elaborate program was adopted, calling for the construction of 500 merchant ships over a period of 10 years, at a cost of \$125,000,000 a year, with generous subsidies by the Government. The report of the Commission to Congress in Feb. 1939, was encouraging. "The long and dangerous decline of our merchant fleet," it said, "has been checked and the process reversed. . . . Prospects for the return of the American flag to a place upon the seas commensurate with our country's position as a world power are the brightest in many years." Up to July 1, 1939, contracts for 67 ships costing \$185,000,000 had been let, of which 24 were to be built for private account with Government aid, and the remainder disposed of to private buyers if they could be found, and if not, to be operated by the commission. Notable among the new additions to the merchant marine were the "Good Neighbor Fleet" of three finely reconditioned 13,000 ton vessels, the "Uruguay," "Argentina" and "Brazil," serving the east coast of South America from Atlantic ports, and the 26,000 ton "America," the largest ship ever built in American yards, to be put in commission in 1940 as the flagship of the American line. Her cost to the Government will be \$17,000,000, but she will be sold to the line for \$10,500,000. More than 50 fast cargo carriers and tankers are also on the list. The U.S. may, therefore, look forward in the near future to the end of the era which saw about 70% of U.S. freight and passengers carried on ships flying a foreign flag. The yards at Fore River, Camden, Newport News and San Francisco hummed with activity during 1939.

There was, however, one fly in the ointment: the effect which the cash-and-carry clause in the Neutrality Act will have on American shipping. Not counting the ships in the Great Lakes and the coastwise trade, there are now 44 Government owned and 282 privately owned vessels in the U.S. merchant marine. The ban in the Neutrality Act forbidding American ships to carry materials to the ports of belligerent countries (except where there are no hostilities actual or threatened) or to enter the danger zones proclaimed by the President, is estimated to affect 6,000 American



THE U.S. NEUTRALITY ACT, major legislative problem of 1939, "looked like serious business" to Hutton of *The Philadelphia Inquirer*

seamen and to threaten a loss of over \$50,000,000 a year to American shippers. What it will mean in the deterioration of idle ships and the loss of trade routes to foreign competitors no one can say. Immediately after the passage of the act early in Nov. 1939, nearly a score of American tankers changed their registry and the United States Lines petitioned the Maritime Commission for permission to transfer a number of its ships to the flag of Panama and to operate them with no American citizens in the crew. The President took the request under advisement and on November 21 pronounced against the petition. Congress was disposed to cause as little harm to the shipping interests and to American trade as possible; but the primary consideration is the avoidance of war. A ship under Panamanian registry would still be owned by Americans, and if it was sunk by a submarine the danger to U.S. peace would be hardly less than it would be if the ship were flying the American flag. Some sort of Government compensation to U.S. shippers for their losses may be devised. (See also SHIPPING, MERCHANT MARINE.)

Aviation.—This section will treat of civil aviation only: military aviation will come under the heading *National Defence*. A report issued by American Airlines, Inc. on Dec. 24, 1939, showed an increase of 44.7% in revenue passenger miles flown during the first 11 months of 1939 over the figure for the corresponding months of 1938. The report listed 488,664 passengers carried, as against 329,348 in 1938, and an income of \$7,452,209, or 42.4% gain over the \$5,233,194 of the previous year. The splendid record for safety and for the regularity of schedules made by the domestic airways in 1938 was maintained during 1939. At the close of the year more than 400 daily scheduled flights (or one every 3.6 minutes) were being made over the expanding air routes of the country. Some 250 passengers a day were being carried

by plane between New York and Chicago. On December 2 the huge LaGuardia Field at North Beach on Flushing Bay, Long Island, was opened, and before the end of the year the daily landings and take-offs mounted to 150, over 2,500 passengers arriving or leaving on the banner day. The 80,000 word report of the Civil Aeronautics Authority to Congress in April declared that the existing airports were inadequate in space, lighting, and equipment, and recommended the expenditure of \$435,000,000 to provide 3,500 ports of the most modern type. Already Congress had provided for the training of 20,000 young pilots between the ages of 18 and 25 to receive 50 hours of instruction each at an estimated expense of \$7,000,000 to the Government. The best of these men were to be retained for further training for national defence. The most important event of the year in aviation was the inauguration of mail and passenger service across the Atlantic. At the beginning of the year Pan American Airways, which has had a virtual monopoly of U.S. foreign flying routes, was building six 40-ton Boeing planes, designed to carry 74 passengers across the sea, and negotiations were made with Portugal and France for landing privileges at the Azores, Lisbon, and Marseilles. Incidentally, England was loath to grant such privileges, because she was announcing the early inauguration of the British Imperial Airways' mail and passenger trans-Atlantic service—not yet begun, however. On May 20 the Pan American "Yankee Clipper" made the first flight from New York to Marseilles, carrying 100,000 pieces of mail. The passenger service was inaugurated on June 28, with a schedule of two (later to be increased to four) round trips a week. The 35 passengers, leaving New York in the afternoon, woke the next morning at the Azores and were in Marseilles before sunset. In the first 6 months of service clippers made 100 crossings without a mishap and have carried 1,700 passengers and over 40 tons of mail. With the war interrupting the regular trans-Atlantic mail service, except for the Italian, Dutch, and Scandinavian ships, air transportation has come at an opportune moment. Probably the next step in aviation will be the "air flivver" or inexpensive small plane, on which much promising work has already been done. In recording the triumph of the trans-Atlantic clippers tribute should be paid to Igor Sikorsky, who has devoted the 20 years of his life in America, since he fled from Bolshevik Russia, to the designing of long distance planes. It was he who built the 17-ton clippers used in the trans-Pacific flights.

The Supreme Court.—At certain times in U.S. history, as in the administrations of Jackson, Lincoln, and Taft, the event of death or retirement has given the President the opportunity to appoint a majority of the members of the Supreme Court. During the first administration of Franklin Roosevelt no vacancy occurred on the bench, but in the last two years he has had no less than five such places to fill. Justices Van Devanter and Sutherland (retired) and Justice Cardozo (deceased) were replaced in 1937–38 by Senator Hugo L. Black, Solicitor General Stanley F. Reed, and Professor Felix Frankfurter respectively. In Feb. 1939, the 82-year-old Justice Louis Brandeis, a Wilson appointee of 1916, resigned, and the President nominated in his stead William O. Douglas of Minnesota, former professor at Yale and chairman of the Securities and Exchange Commission, to be the youngest member of the court (40). Pierce Butler of Minnesota, a Harding appointee of 1922 and a conservative corporation lawyer, died in November. The President deferred the naming of his successor (Frank Murphy) until the meeting of the third session of the 76th Congress in Jan. 1940. The new appointments have naturally changed the complexion of the Court, eliminating all the opponents of the New Deal except Justice McReynolds, the most intransigent of them all. On April 17 the Court by a vote of six to two ruled the Agricultural Adjustment Act of 1938 constitutional. (It will be recalled that the AAA of 1933 was declared unconstitutional

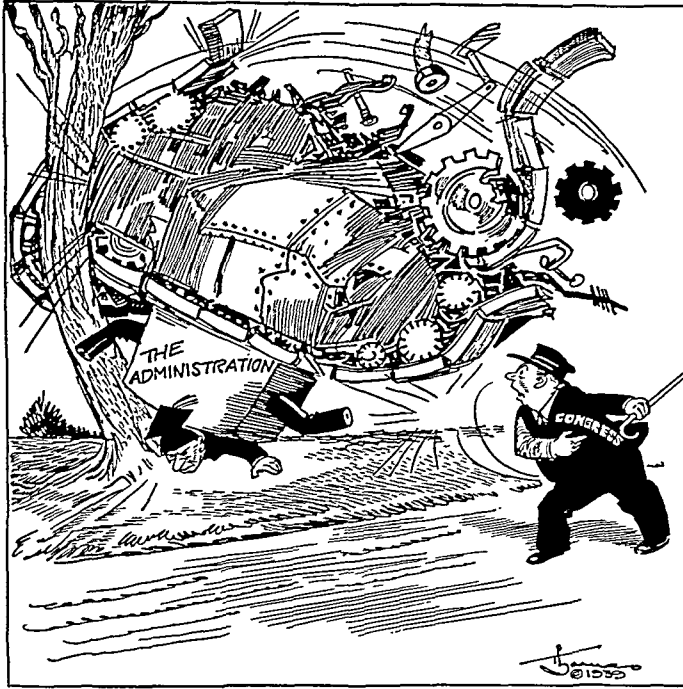
by a unanimous decision of the court on Jan. 6, 1936.) We have already noted the Court's reversal in March 1939, of the *Fansteel* order of the NLRB. Another important decision, the next month, upheld the power of the Federal Government to tax the salaries of State employees (more than 2,500,000 in number) and the reciprocal right of the State Governments to tax the salaries of the 1,200,000 Federal employees. To those who interpreted this as a reversal of Marshall's decision in *McCulloch vs. Maryland* (1819) it was pointed out that the latter case concerned the interference of a State with the operations of a Federal corporation by taxing the business transactions of a branch bank of the United States, whereas the 1939 law was to tax only the personal incomes of the Federal servants. The Court's decision in the *Joe Strecker* case (April 17, 1939) was expected to furnish a precedent for dealing with Harry Bridges, an alien labour agitator on the Pacific coast, who belonged to the Communist party. As Strecker had ceased to be a member of that party, the Court supported his right, though an alien, to remain in the country. On December 29 special investigator J. U. Landis found no cause for the deportation of Bridges.

Foreign Trade.—The boom in foreign trade which was predicted on the outbreak of war in Europe, and was predicated on the enormous increase of U.S. exports during the World War (1914–18) failed (at least, in 1939) to occur. For the first two months of the war (September and October) U.S. exports showed a rise almost exactly parallel to that of the corresponding months of 1914; but in November, in spite of more than a 100% increase over October in the export of aircraft, total exports fell off considerably, those to the United Kingdom, for example, declining from \$55,634,000 in October to \$42,439,000. This has been explained partially by the fact that Great Britain is buying as much as possible in her own dominions (wheat from Canada and wool from Australia) and is increasing her imports of food stuffs from South America to cut in on the German trade. But there were other factors at work to keep U.S. trade from swelling to the enormous figures it reached in the World War. We have already seen in the section on the *Merchant Marine* what a handicap on American trade is imposed by the terms of the 1939 Neutrality Act. It is impossible at this stage (Jan. 1, 1940) of the European conflict to predict what effect it will have on American commerce. If the war develops into a long and serious contest on land, Great Britain, and the other maritime belligerents may well be obliged, in spite of the U.S. ban on foreign loans and the demand for cash payments in American dollars, to come to America for large supplies of war materials and food. Meanwhile, U.S. merchant ships endeavoured to avoid being tied up in port by shifting their routes to permitted shores. The "Washington" and the "Manhattan," for example, were scheduled to run to Italy; and other lines to serve Spanish, Portuguese, and Latin American ports.

National Defence.—It was doubtless the general apprehension of the outbreak of war in Europe (especially after the failure of the Munich "appeasement" policy of Sept. 1938), and of the possible extension of war to the United States, that determined the ready response of the 76th Congress to the President's request for unprecedented appropriations for the national defence. A Gallup poll at the beginning of 1939 showed 82% of the voters in favour of large increases in the army, 84% for strengthening the navy, and 90% for a vast enlargement of our air forces. Shortly after his budget message including more than \$1,000,000,000 for defence, the President sent a special message to Congress (January 12), asking for an additional \$551,000,000. The House, in March, voted to increase the army's air force from about 2,000 to 5,500 planes, with generous appropriations for anti-aircraft guns, artillery, tanks, and improvements in the defences of Puerto

Rico, Alaska, Hawaii, and the Panama Canal. The army appropriation of \$499,800,000 for the fiscal year 1939–40 was the largest ever made by Congress in time of peace. A bill was also passed authorizing the Government to purchase large supplies of "strategic" material (See also STRATEGIC MINERAL SUPPLIES), not produced at home in sufficient quantities to carry the nation through a war, and a War Resources Board, with E. R. Stettinius of the United States Steel corporation as chairman, was appointed to coordinate the efforts of business, labour and the Government in supplying the hundred thousand articles which the country would need in time of war. More than \$65,000,000 was allotted to the navy, and two new 45,000-ton battleships were authorized, in addition to a large number of auxiliary craft. To guard against the establishment of enemy naval bases in American waters, from which bombing planes might threaten U.S. cities, the navy was directed to "develop and increase our naval facilities" at various points and to establish 12 new naval bases, nine of them on the Pacific islands. Interesting events of the year were the speed-breaking flight of a Curtis-Hawk pursuit plane (built in the U.S. for the French army) at the rate of 575 m.p.h., and the invention of the bakelite "plastic" plane which can be built at a third of the cost of the metal plane.

The Third Term Issue.—With the approach of a presidential year, 1940, a question uppermost in the discussion of domestic politics was, will President Roosevelt break an American precedent by running for a third consecutive term? A poll of the Institute of Public Opinion in May 1939 recorded only 33% in favour of a third term to 67 against it. In August the figures had changed to 40 and 60 respectively, and in October to 43 and 57; and in the last of these polls an actual majority (52 to 48) voted for a third term if the war in Europe continued until the nominating conventions met in 1940. Meanwhile, the President himself maintained a Sphinx-like silence on the subject, or passed off the attempts of his supporters to commit him with a humorous remark. As the year closed the outstanding candidates for the Republican nomination were District Attorney Thomas E. Dewey of New York, Senator Arthur H. Vandenberg of Michigan, and Senator Robert A. Taft of Ohio. The Democrats were embarrassed by the silence of their chief as to his intentions. A dozen or so of their prominent men, like Farley, Hull, McNutt, Wheeler, Clark, Tydings, and Speaker Bankhead, it was indicated, would respond to the call of their party if Roosevelt declined to run; but up to Jan. 1, 1940 only Vice-President John N. Garner actually threw his hat in the ring. A few days before the close of the year the papers announced that "definite information" had come from Washington that the President had told his friends that he did not wish to run in 1940; but, in 1939, no direct word from himself, like Coolidge's renunciation more than a year before the election of 1928, formally released his possible competitors. The sentiment in the country was strong against a third term. Twice Congress has passed a resolution to the effect that a third term would be inexpedient and fraught with danger to the Republican system. The fear that the nomination of a conservative Democrat might split the party, the conviction that the policies of the New Deal still need to be entrusted to the master hand that framed them, and the belief that President Roosevelt's popularity with the masses will insure his re-election if he is nominated led men like Secretaries Wallace and Ickes, Attorney General Jackson, Ambassadors Kennedy and Davies (on home visits from London and Brussels), and the Democratic governors of several States to urge a third term in spite of the established precedent. Furthermore, it seemed that a continuance of the war in Europe was likely (as the Gallup poll noted above indicated) to strengthen the sentiment for a third term. For no action of the President in 1939 met with more approval than his sincere and judicious efforts first to prevent the



CONGRESS "didn't know its own strength" in wrecking legislation sponsored by the New Deal in 1939, notes Thomas in *The Detroit News*

outbreak of war and then to encourage an acceptable peace. His April letters to Hitler and Mussolini, his success in the revision of the Neutrality Act in November, and especially his letter of December 23 to Pope Pius XII, offering his co-operation in the cause of peace and suggesting that it would give him "great satisfaction to send to you my personal representative in order that our parallel endeavours for peace and the alleviation of suffering may be assisted" won enthusiastic response throughout the country. As peace envoy to the Vatican the President appointed Myron C. Taylor, who had presided at the Evian conference on the refugee problem, and asked Dr. George A. Buttrick of the Federation of the Churches of Christ and Rabbi Cyrus Adler, president of the Jewish Theological Seminary of America to serve as aids by coming to Washington from time to time for counsel. Incidentally, Taylor's mission will be the first U.S. official connection with the Vatican (if President Theodore Roosevelt's dispatch of William H. Taft to the papal court in 1902 to arrange for the purchase of the church lands in the Philippines is excepted) since the last American minister to the Papal States, Rufus King of Wisconsin, left Rome in 1868.

Social Security.—The Social Security Act of Aug. 1935, which President Roosevelt declared the most important piece of legislation in his administration, was perhaps the "instrument" of social improvement most in need of the "machining down" of which the President spoke in his opening message to the 76th Congress. Both because of its immense scope in providing benefits for the aged, the unemployed and the disabled, and because it was hastened in order to check the alarming spread of unsound pension schemes like those of Dr. Francis E. Townsend, Father Coughlin and the late Senator Huey Long, it stood in need of revision. In the November elections of 1938 the voters in half a dozen States had the issue presented, and in California the "\$30-every-Thursday" ("Ham and Eggs") pension for persons over 60 years of age, a scheme sponsored by Sheridan Downey, who won the election to the United States Senate, failed of adoption by the narrowest of margins. The President sent a special message to Congress in Jan. 1939, recommending drastic amendments to the Act of 1935, and in the course of the year the following changes were made in the law: (1) certain classes of workers, like bank employees and mari-

time labourers who were not included in the original act, were admitted to its benefits (though farm labourers and domestic servants were still excluded); (2) the payments to persons of 65 who were covered by the old-age insurance were to begin on Jan. 1, 1940, instead of Jan. 1, 1942; (3) the assessments of 1% on wages and salaries which were to be paid by both employer and worker were "frozen" at that figure until 1943, instead of being increased to 1½% in 1940 as was provided in the original bill. The rate of contribution will be 2% each in 1943, 2½% in 1946, and 3% in 1949; (4) the scope of the act was widened to take in the family of the worker. His wife on reaching the age of 65 will receive a pension equal to half of her husband's, and a widow will get three-fourths her deceased husband's benefits. Also the children under 16 (or if they are going to school, under 18) will each receive the half pension. Under the original act the collections from the assessments in 1938 and 1939 reached the sum of \$966,000,000, and it was estimated that a fund of \$47,000,000,000 would be built up by 1980. The new amendments of 1939 will prevent the accumulation of this huge trust fund in the Treasury, and tend to equalize receipts and payments. It is estimated by the actuaries that until about the year 1955 the collections will exceed the payments by some \$7,000,000,000; but that this surplus will then begin to dwindle as more people reach the age of 65, with their claims to larger pensions on account of their longer years of service. However, the Government is content not to look now beyond the year 1955. About 45,000,000 Social Security accounts were on file at Washington in 1939. The Government expects to pay \$114,000,000 during 1940, \$430,000,000 in 1942, and so on in increasing amounts. The success of the liberalized law in checking the "wild-cat" pension schemes was shown by the decisive vote of 302 to 97 against the Townsend plan in the House, in June 1939, and the defeat of Downey's "Ham and Eggs" proposal in California and a similar Bigelow scheme in Ohio by two-to-one and three-to-one votes, respectively, at the November elections. (See also SOCIAL SECURITY.)

Housing.—One of the most disgraceful features of this uneven civilization has been the great number of families (estimated at 10,000,000 or about a third of the population) living in habitations unfit for human beings. How much the lack of a decent setting for home life contributes to the annual crime bill of \$15,000,000,000, the U.S. homicide rate which is the largest of all the civilized countries of the world, and the prolific production of youthful criminals it is impossible to say. What danger to the community is threatened by the disease breeding slums is evident to all. The United States Housing Authority, under its administrator Nathan Straus, has been attacking the evil of the slums with vigour. In a report of Dec. 15, 1939, he listed the elimination of 9,750 "substandard" dwellings in 26 cities and their replacement by 17,717 new ones, and cited more than 125 low-rent projects now under way. The rent problem is the crux of the situation. With three-quarters of the urban population living on incomes of less than \$2,000 a year, only 15% of the satisfactory dwellings come within the range of what such families can afford to pay for rent. The Home Owners' Loan Corporation and the Federal Housing Authority have helped thousands to borrow money on loans guaranteed by the Government to preserve and improve their habitations; but the need for low-cost houses and apartments is crying. In 1925 the U.S. built 937,000 new dwelling units and employed 2,400,000 workers in their construction. In 1933 these figures dropped to 54,000 and 656,000 respectively. By 1939 the country had recovered about half the figures of 1925, but still, even with generous Government aid, the U.S. is far from producing the accommodations which the growing population needs. Besides, when it is considered that the building industry is the largest consumer of lumber, cement, glass, brick, and

plumbers' supplies, we realize the depressing effect which this lag in construction has upon business recovery and renewed employment. Private interests have made their contribution to the solution of the housing problem. In Oct. 1939, a \$13,500,000 project was opened at Long Island city, consisting of 26 Y-shaped apartment houses to accommodate over 3,000 families at rentals of \$5.40 a month per room. And the Metropolitan Life Insurance company at a cost of \$50,000,000 was building "Parkchester," a group of 12,269 apartments to house 40,000 people, to be ready for occupancy in the spring of 1940. But even the lowest apartment rents (of \$32 a month) in the new buildings will be too high for any but the "middle class."

Latin-American Relations.—No progress was made during the year 1939 toward solving the crisis caused by the decree of the Mexican government on March 18, 1938, expropriating American owned lands valued at \$25,000,000 and American owned oil interests, over-valued by the companies at \$450,000,000 and probably worth about half that amount. For the lands, which President Cardenas has taken to distribute to the landless peasants, in a serious determination to carry out the policy of his former chief, the ill-fated President Madero, compensation has been promised; but the only concession to the oil companies is a right to claim compensation in the Mexican courts for their actual investments. The U.S. State Department made the proposal in August that the operation of the oil wells (which was being badly managed by the native managers) should be entrusted to a board representing the Mexican government, the American oil companies, and three neutral oil experts. But the offer was summarily rejected by Cardenas. On December 2 the Mexican Supreme Court upheld the expropriation of the oil properties by a unanimous vote, denied the companies any right to claim compensation for concessions, and declared that the government might delay recompense for investments for ten years. A few days later the arbitrary policy of Mexico recoiled upon her own head, when a Hull trade agreement with Venezuela reduced by 50% the tariff on a certain quota of foreign oil imported into the United States. Because American importers had boycotted Mexican oil, that country found itself deprived of all but a tiny percentage of the concession. Meanwhile, the U.S. Government, pledged to the "good neighbour" policy, had no thought of bringing force to bear on Mexico. President Cardenas' term in 1939 was drawing to a close, and he is not eligible for re-election in 1940. Should he be succeeded by a conservative candidate, the American oil interests expect some compromise, such as, for example, one suggested recently that the Mexican government set aside for instalment payments to American companies a percentage of its sales to foreign countries.

With the rest of Latin-America U.S. relations during the year 1939 were closer and more cordial perhaps than ever before. The cumulative effect of the "good neighbour" policy, announced by President Roosevelt in his inaugural address of 1933, and implemented by such actions as the repeal of the Platt Amendment, the withdrawal of the last American marines from Haiti, the negotiation of a dozen trade agreements by Secretary Hull, and the conciliatory attitude of the United States delegations at the Pan-American Conferences at Montevideo, Buenos Aires, and Lima, has been to remove in large part the fear of "Yankee imperialism" which troubled the minds of the sister republics to the South. A genuine Pan-Americanism (in which the United States is just as much, and not more, of the "Pan" as Bolivia or Honduras) is replacing the quasi-dictatorial interpretation of the Monroe Doctrine which would make the United States the protector of the Latin-American republics. The year 1939 saw many evidences of this community of interests, inspired to a considerable extent by the resolutions adopted by the eighth Pan-American Congress at Lima in the closing days of 1938. The most important of those

110 resolutions were: (1) an agreement among the American republics to consult on measures of common protection from aggression by foreign powers, especially the Fascist dictators; (2) the reduction of trade barriers; and (3) the improvement of the machinery for the preservation of mutual good relations and peace among the Latin-American countries. The trend away from reliance on the League of Nations to guarantee their "political independence and territorial integrity" and toward a greater confidence in a Pan-American solidarity has been marked. Nine of the Latin-American republics (including all the Central American States) had already severed their connection with the League, when Peru, in April 1939, gave notice of its withdrawal, leaving only one-half of the American States represented at Geneva. As this process of defection from the League has gone on, however, the ties between the United States and her southern sisters have grown closer. Several important South American officials were ceremonially welcomed at Washington during 1939, Foreign Minister Aranha of Brazil coming in February, President Somoza of Nicaragua in May, for example; while loans from the Export-Import bank in Washington to Brazil, Nicaragua, Chile, Cuba, Paraguay were planned to encourage financial stability in Latin-America and improve commercial relations there.

Latin-America is the richest producer of raw materials of all the regions of the world that are not under the control of some great foreign power, supplying 88% of the world's coffee, 42% of its silver, 16% of its wool, 15% of its sugar, and a goodly portion of its copper, nitrates, and oil. United States investments in Latin-America amount to nearly \$5,000,000,000, and U.S. trade there in 1939 totalled about \$1,000,000,000, far exceeding that of Great Britain or Germany, the nearest competitors. Yet, with the advantages the United States has in location and in political influence in Latin-America, U.S. trade with that region should be much larger than the 18 to 20% of its total foreign trade. Two events are calculated to further this interest. Trade agreements negotiated by Secretary Hull have now been made with 11 Latin-American governments, the latest being that of May 1939, with Ecuador and of November with Venezuela. Negotiations are also pending with Argentina, Chile, and Uruguay. The law of 1934 (renewed in 1937) empowering Secretary Hull to conclude these agreements expires on June 12, 1940. Opposition to its second renewal in the summer of 1940 has developed among three classes: the western farmers, who resent the competition of foreign food products; the high protectionists, who always oppose any entering wedge in the tariff walls; and Senators, always jealous of their privileges, who do not like the delegation of this power to the executive branch and demand that the agreements be ratified by the Senate like any other treaties. Mr. Hull and his associates have pointed to the excellent results of the score of trade agreements, covering countries with which the U.S. does over 60% of its commerce, and declare that a refusal to continue the arrangements would be to send us back to the "anarchy" of the Smoot-Hawley days. They have the enthusiastic support of President Roosevelt. A second aid to Latin-American commerce is the inauguration of the "good neighbour" fleet of fine steamers (the "Argentina," the "Brazil" and the "Uruguay"), noted in the section on the *Merchant Marine*.

Numerous conferences among the Latin-American States during 1939 showed a growing solidarity of interests, especially stimulated by apprehension as to what effect the European war may have on the countries on this side of the Atlantic. In February co-operation in air lines was planned. In March an International Congress of American Democracies met at Montevideo to consider ways and means of strengthening republican institutions against the threat of Fascist penetration. A conference of 21 American nations at Panama approved of the Declaration of Panama, on

October 2, fixing a 300-mile limit of the American shore, in which the belligerent powers were asked not to conduct naval operations. And Brazil, Argentina and Uruguay agreed to pool their navies to patrol the 6,000 mi. of the east coast of South America from the mouth of the Amazon river to Cape Horn. Hitler sneered at the Lima Conference of Dec. 1938, as "the American failure number one." But Thomas Ybarra may be nearer the truth when he asserts (in "America Faces South") that "perhaps a genuine Pan-Americanism was born at Munich."

Foreign Relations: Japan.—The outstanding event of the year 1939 in U.S. relations with Japan, which had been far from harmonious since the isolated protest of Secretary of State Stimson against the Japanese seizure of Manchuria in 1931, was the notification of Secretary Hull to the Japanese government on July 26 that the commercial treaty of 1911 would be terminated at the end of the prescribed time limit of six months (Jan. 26, 1940). This action was an example of President Roosevelt's warning, in his address to Congress on January 4, that there were "many methods short of war, but stronger and more effective than words, of bringing home to aggressor governments the aggregate sentiments of our own people." For it was undeniable that Japan, in spite of protests against the infraction of the Nine Power Treaty of 1922 and the Kellogg Peace Pact of 1928, was pushing on ruthlessly toward the conquest of China. Every sign of weakness on the part of the western powers, like the surrender at Munich, encouraged her in a new move of aggression. And the "aggregate sentiments" of the American people were clearly shown in polls which condemned Japan and advocated a boycott against her commerce by a majority of over 70%. The acts which led immediately to the denunciation of the 1911 treaty were Japan's threat to attack the international settlement at Shanghai on May 9; and her direct assault a few days later on the British and French concessions at Tientsin, put all foreigners in jeopardy. Despite repeated assurances that no harm to foreign interests was intended and prompt apologies from the civil power in Japan for harm inflicted, it was evident that a determined group of the younger military officers was in the saddle at Tokyo, who would stop at nothing to establish an exclusive domination over China. Now, the abrogation of the treaty of 1911 would release the United States from its obligation to deal with Japan on "the most favoured nation" basis and open the way, should the U.S. so desire, to lay that embargo on her commerce which Senator Pittman, chairman of the Committee on Foreign Relations, has long been advocating. Since Japan has been getting more than half her war materials from the United States, the seriousness of an embargo on arms, ammunition, cotton, steel and scrap metal is evident to her statesmen; it has been rumoured that Secretary Hull and Ambassador Horinouchi in Washington, as well as Ambassador Grew and Foreign Minister Nomura in Tokyo, have been at work on new treaty terms which may improve U.S. relations with Japan. The Japanese, meanwhile, announced (December 23) their readiness to reopen the Yangtze river as far up as Nanking to foreign ships; and a statement at the same time from the U.S. Treasury Department that no tariff discriminations or punitive harbour charges against Japan were contemplated has relieved the merchants of both countries from much of their anxiety over the proposed abrogation of the treaty of 1911.

The matter resolves itself into a question of American indignation over the political and military aggressions of Japan in China versus the interests of U.S. trade with Japan. The United States is Japan's largest customer, purchasing about 70% of her chief export commodity, raw silk. Next only to Canada and the British Isles, Japan is also the best customer of the United States.

United States trade with her is many times that with China, in spite of the manifest sympathy of the American people with the

Chinese and the enormous potential market of the Celestial Empire. For example, of the total U.S. trade with the Orient in 1939, 43% was with Japan, as against only 14% with China. It is certain that American merchants, whatever be the fate of the 1911 treaty, will strive to maintain this trade; but, on the other hand, they will view with alarm any military and naval development of Japan which would give her control over the sources in the far East (like the Philippines or the Dutch Indies) whence the U.S. draws many indispensable products, like rubber, tin, camphor, vegetable oils, hemp, jute, chromium and other non-American commodities.

Roosevelt and the Dictators.—When it became evident that the concessions made to Hitler at the Munich conference of Sept. 1938, failed to deter him from his course of aggression, anxiety over the outbreak of another European war which might involve the United States grew more serious. In March 1939, the Fuehrer entered the Czech capital of Prague and proceeded, through the military and then the secret police (the Gestapo), to reduce the whole of Czechoslovakia, whose independence he had solemnly guaranteed, to a vassal state. On April 7, Mussolini seized Albania. A week later President Roosevelt, who had already sought by telegrams to Hitler and President Benes to bring about a peaceful settlement of the Sudeten crisis, sent messages to both Hitler and Mussolini, asking them to agree for a period of 10 years not to attack any of 31 weaker nations which he listed, and promising that, in case they so agreed, he would request these nations to give a counter-pledge not to attack Germany or Italy. Hitler replied in a long speech before the German Reichstag on April 28, in which he justified his behaviour, boasted of the unconquerable might of the Third Reich, and heaped sarcastic abuse on President Roosevelt as a meddler who had no understanding of the situation. Having extinguished the liberty of Czecho-Slovakia, Hitler's next step was to demand Danzig and a German zone through the Polish Corridor. As the situation grew tense, the President again interceded, with telegrams (August 24) to Hitler, the President of Poland, and the King of Italy, urging arbitration, mediation, or direct negotiation for the settlement of the dispute. But again Hitler ignored the pleas for peace, and, having made a most unnatural alliance with Soviet Russia, ruthlessly invaded Poland on September 1. The unhappy country, caught between the armies of Hitler on the west and Stalin on the east, was reduced to submission, with frightful slaughter, in a month's time. This final outrage of the Fuehrer brought England and France, the guarantors of Poland, to the end of their patience, and on September 3 they declared war on Germany. The outbreak of the European war also brought President Roosevelt, who, with the unanimous approval of the American people, had made such extraordinary efforts for the preservation of peace, to call Congress in the extra session (noted above) for the revision of the Neutrality Law. As the year closed, it was impossible to answer the questions on everybody's lips: Will the war be long? Will it develop, as it has not yet, into a death struggle between the totalitarian dictators and the democracies of western Europe? Will the U.S. be drawn into it? Will some "incident" involving the loss of American life or property, despite all the safeguards with which the U.S. has been able to surround them, prove too much of a strain on American neutrality? Will the appeal to save democracy again cause the United States to throw its physical as well as its moral strength into the fight against the dictators? The experience of the American merchant vessel "City of Flint," stopped in the mid-Atlantic, in October, by a German warship and taken to the Russian port of Murmansk, contrary to international law, shows how little regard for American rights will be shown by desperate belligerents; and the battle off the estuary of La Plata, resulting in the blowing up of the German pocket battleship "Graf

Spee," together with the "suicide" of the German liner "Columbus" off the New Jersey coast, and the internment of her crew at Ellis island, in December, show that the war may come still closer to American shores. Eternal vigilance and sane statesmanship must be exercised to preserve the blessing of peace for the United States. (See also ANTI-SEMITISM; ARMIES OF THE WORLD; CANADA; JAPAN; DEMOCRACY; FINANCIAL REVIEW; INTERNATIONAL LAW; MEXICO; NEUTRALITY; PROPAGANDA; PUERTO RICO; ROOSEVELT, FRANKLIN DELANO; STRATEGY OF THE EUROPEAN WAR; VIRGIN ISLANDS.) (D. S. MU.)

Transportation.—For statistics on transportation and communications see the articles AVIATION, CIVIL; ELECTRIC TRANSPORTATION; MOTOR TRANSPORTATION; MOTOR VEHICLES; POST OFFICE; RAILROADS; SHIPPING, MERCHANT MARINE; TELEPHONE.

Agriculture.—For the second successive year, agricultural production declined from the record output of 1937. The acreage for harvest in 1939 was estimated at 317,957,000 as compared with 329,908,000 in 1938. Actual production declined in approximately the same ratio. Notable individual exceptions were corn, which according to preliminary estimates had record-breaking yields (more than 51 bu. per acre) in Indiana, Illinois and Iowa; and tobacco and soybeans, both of which were bumper crops.

Production figures of selected crops for the last eight years (000 omitted) are as follows:

Year	Corn	Oats	Wheat	Cotton	Cottonseed	Tame Hay	Rice	Tobacco	Potatoes
1932	2,931,281 bu.	1,259,955 bu.	756,927 bu.	13,093 bales	5,784 tons	71,827 tons	41,619 bu.	1,017,317 lbs.	376,425 bu.
1933	2,399,632	733,166	551,683	13,049	5,806	66,530	37,651	1,371,131	342,306
1934	1,461,123	543,306	526,393	9,636	4,282	55,270	39,047	1,081,620	406,105
1935	2,303,747	1,194,902	626,344	10,638	4,729	78,138	38,784	1,297,155	386,380
1936	1,507,089	785,506	626,766	12,399	5,511	63,536	49,002	1,154,131	331,018
1937	2,644,995	1,146,258	873,903	18,946	8,426	73,785	53,364	1,553,495	393,280
1938	2,542,238	1,053,839	930,801	11,943	5,400*	80,299	52,303	1,378,534	371,617
1939*	2,591,063	941,230	739,445	11,792	..	75,023	52,204	1,659,499	361,765

* Preliminary.

Livestock shipments at public stockyards were, with the exception of sheep, larger in the first ten months of 1939 than in the comparable period of 1938. Total shipments of cattle through October were 4,990,000 (4,925,000 in the same period of 1938); calves, 2,276,000 (2,058,000); hogs, 5,735,000 (5,539,000); and sheep, 10,304,000 (10,916,000).

The following table lists average prices received by farmers for important crops on selected dates (all in cents):

	Wheat per bu.	Corn per bu.	Oats per bu.	Barley per bu.	Rye per bu.	Buck- wheat per bu.	Pota- toes per bu.	Eggs per doz.	Cot- ton per lb.
Oct. average, 1909-13	88.1	64.8	38.4	60.5	72.0	71.1	65.0	23.8	12.10
Oct. 15, 1936	106.8	97.9	43.1	84.2	80.4	78.3	97.9	27.6	12.23
Oct. 15, 1937	88.7	58.9	28.8	52.0	63.8	62.4	48.5	25.2	8.10
Oct. 15, 1938	52.2	41.9	22.1	36.1	32.9	54.5	51.0	27.1	8.53
Oct. 15, 1939	70.3	47.6	30.3	42.2	45.1	62.7	66.4	22.9	8.73

See also AGRICULTURE and the articles on individual agricultural products.

Manufactures.—The last biennial census of manufactures taken by the U.S. Department of Commerce was published in Dec. 1938 and was for the calendar year 1937. The leading industries according to value of products were in the following order: motor vehicles and parts; steel-work and rolling-mill products; meat packing; petroleum refining; printing and publishing; clothing (excluding shoes, hosiery and millinery); electrical machinery and supplies; bread and bakery products; tobacco products; and cotton manufactures. The total number of manufacturing establishments in 1937 was 166,793; salaried employees, 1,216,993; wage earners, 8,569,578 (average for year). Salaries amounted to \$2,716,473,756 and wages \$10,112,808,089. Total value of all U.S. products was \$60,710,072,958.

Foreign Commerce.—The United States had a favourable trade balance of \$738,381,000 for the first 11 months of 1939, compared with a favourable balance of \$1,036,415,000 in the equivalent period of 1938. Exports in 1939 decreased fractionally, while imports rose more than 15%. Foreign trade in merchandise for the first 11 months of 1938 and 1939 by continents was as follows:

U.S.A.	Europe	N.America	Asia	S. America	Africa	Oceania
1938 exports	\$1,213,209	\$687,211	\$463,770	\$271,174	\$105,206	\$84,926
1938 imports	513,559	453,308	519,404	238,076	50,527	14,207
1939 exports	1,128,877	729,759	491,817	285,159	103,770	70,191
1939 imports	559,903	530,535	609,859	279,808	66,684	24,346

By the end of 1939, exports to Germany were practically non-existent. The U.S. Bureau of Foreign and Domestic Commerce reported exports of only \$2,559 to Germany in Nov. 1939 (\$8,617,995 in Nov. 1938). Imports were \$2,656,055 (\$6,922,373 in Nov. 1938).

Petroleum was again the leading export in 1939, while rubber, non-ferrous metals, and coffee were the leading imports. Sugar, the leading import of 1938, fell to fourth place. Grain showed the sharpest decline among exports. Aircraft and aircraft parts rose from \$62,512,000 in the first 11 months of 1938 to \$88,016,537 in the same period of 1939.

Labour.—For data on labour in 1939, see the articles AMERICAN

FEDERATION OF LABOR; CONGRESS OF INDUSTRIAL ORGANIZATIONS; LABOUR UNIONS; RELIEF; SOCIAL SECURITY; STRIKES AND LOCK-OUTS; UNEMPLOYMENT; WAGES AND HOURS.

Mineral Products.—Statistical information on the mineral industry released by the Bureau of Mines of the U.S. Department of the Interior in 1939 pertained to the year 1938 (see also separate articles on minerals and metals). According to preliminary estimates, the total value of all mineral production in that year was \$4,354,000,000—a decrease of approximately 20% from the

Total Imports and Exports 1932-1939
(000 omitted)

Year	Export Total	% Increase	Import Total	% Increase
1932	\$1,611,016	..	\$1,322,774	..
1933	1,674,094	3.9	1,449,550	9.6
1934	2,132,800	26.5	1,655,955	14.2
1935	2,282,874	7.0	2,047,485	23.8
1936	2,455,078	7.6	2,422,592	18.3
1937	3,340,167	36.4	3,083,068	27.7
1938	3,004,440	-7.6	1,960,428	-36.4
1939*	2,809,574	-5.6	2,071,193	15.7

* 11 months; percentages of increase and decrease compared with 11 months of 1938.

Leading U.S. Exports and Imports—through Nov. 1939

Exports		Imports	
Products	Value	Products	Value
Petroleum and products	\$348,237,265	Rubber and manufactures	\$154,938,175
Industrial machinery	260,514,643	Non-ferrous metals*	148,560,388
Iron and steel products	245,970,611	Coffee	125,794,482
Automobiles and parts	228,896,040	Sugar and products	121,673,681
Cotton, unmanufactured	199,781,113	Paper and manufactures	115,885,035
Non-ferrous metals*	128,337,303	Silk and products	114,685,068
Electrical machinery	94,441,549	Paper base stocks	78,936,582
Grains and preparations	92,875,200	Wool and manufactures	67,681,699
Aircraft and parts	88,016,537	Furs and manufactures	50,405,103
Tobacco and manufactures	86,145,017	Beverages, alcoholic	49,993,885
Fruits and preparations	76,822,513	Precious stones; imitations	46,210,877

* Except precious.

\$5,413,600,000 of 1937. In 1936 the value was \$4,556,800,000. Metals as a group suffered the greatest decline—about 40%—whereas the non-metals and mineral fuels each declined about 12%. Gold alone among the 10 principal minerals showed an increase in production. Production of pig iron and iron ore had the sharpest decrease, the latter metal dropping from \$207,828,213 in 1937 to \$74,322,405 in 1938. The leading mineral products of the U.S.A. in 1938, each with a total output value of more than \$100,000,000 were as follows:

Mineral	1938 value	1937 value
Petroleum	\$1,390,000,000	\$1,513,340,000
Bituminous coal	655,000,000	864,042,000
Natural gas	500,870,000	528,354,000
Pig iron	350,875,369	731,139,435
Coke	Not available	201,003,903
Pennsylvania anthracite	180,600,107	197,598,849
Gold	178,143,400	168,158,900
Cement	150,535,303	171,414,093
Stone	139,255,046	146,213,128
Copper (domestic ores only)	110,216,000	201,988,000

Finance and Banking.—Statistics pertaining to the United States will be found in separate articles such as BANKING; BONDS; BUDGET; FINANCIAL REVIEW; GOLD RESERVES AND GOLD STANDARD; GOVERNMENT EXPENDITURES; NATIONAL DEBTS; NATIONAL INCOME; STOCK EXCHANGES; STOCKS; TAXATION; WEALTH AND INCOME, DISTRIBUTION OF.

Defence.—Following Great Britain's and France's declaration of war against Germany, President Roosevelt on Sept. 8, 1939 declared a limited national emergency and ordered that all branches of the U.S. armed forces should be increased in strength. At the end of the fiscal year 1939, the actual strength of the U.S. Army by components was as follows:

	Commissioned Officers	Warrant Officers	Enlisted Men	Total
Regular Army	13,932	775	174,079	187,886
National Guard	14,455	211	184,825	199,491
Organized Reserve	110,719	..	3,054	119,773
Total, U. S. Army	144,206	986	361,958	507,150

All three components gained in numbers during the year, and the total net gain was 10,340 men. Expenditures of the U.S. War Department for the fiscal year ended June 30, 1939 were \$705,062,795. The U.S. Navy at the end of the fiscal year 1939 had 110,100 enlisted men and 6,877 line officers on the active list. The U.S. Marine Corps had an average enlisted strength of 17,500 men during the year. New enlistments in the Navy were 14,460 from 159,409 applications; re-enlistments were 80-81% as compared with 72-21% in 1938. Recorded expenditures of the Navy Department for the fiscal year 1939 were \$633,219,988.13; estimated expenditures for 1940, \$863,671,083.73.

The following is a summary of U.S. vessels, classified under the 1936 London Naval treaty, as of June 30, 1939:

	Number (including over-age)	Building or Appropriated for
Battleships	15	8
Aircraft carriers	5	2
Cruisers	34	9
Large mine layers . . . . .	..	1
Destroyers	221	43
Submarines	89	25

The battleships under construction on July 1, 1939 were the "North Carolina," "Washington," "South Dakota," "Indiana," "Massachusetts," "Alabama," "Iowa" and "New Jersey." The numerical strength of the U.S. Navy at the end of 1939 is discussed in the article NAVIES OF THE WORLD. For additional data on the U.S. armed forces, see AIR FORCES; ARMIES OF THE WORLD; MARINE CORPS; NATIONAL GUARD.

United States Government Departments and Bureaus: see GOVERNMENT DEPARTMENTS AND BUREAUS. Also see under specific name, i.e. COAST GUARD, U.S., etc.

United States Housing Authority: see HOUSING; MUNICIPAL GOVERNMENT.

United States Mint: see COINAGE.

Universal Service: see ARMIES OF THE WORLD: Military Service.

Universities and Colleges. Continuous interest in higher education in the United States is shown by a steady growth in attendance, which is especially noticeable (1939) in the junior college and the graduate college. Five hundred seventy-five junior colleges, having enrolments totalling 196,710, were listed in 1939, as compared with 554, having 155,112 students in 1938. Enrolment in private junior colleges increased 20%; that of public junior colleges, about 30%. Distributed widely throughout the United States, junior colleges have had greatest development in the Middle and Far West and range in size from less than 100 students to from six to eight thousand. Thirty-two junior colleges enrolled more than 1,000 students each.

A recent statement by the American Association of Junior Colleges says: "Terminal education, at the junior college level, includes so-called 'general' education, designed to prepare students for social citizenship and for individual happiness, and semi-professional and perhaps other types of vocational education, designed to prepare students for economic independence."

Many colleges are considering new possibilities of improving the opportunities in general education within the framework of the four-year liberal arts college. This involves a more flexible program of college studies and a modification of the requirements for the bachelor's degree. Post-graduate registration for 1938-39 exceeded 90,000 students, a growth of more than 10,000 within two years. Notwithstanding the current increase in the demand for teachers with the M.A. or Ph.D. an over-supply is feared in many quarters. A few universities are taking definite steps ultimately to improve their methods of selecting students for graduate work. The fact that nearly 200,000 first- and second-year students now attend junior colleges accentuates the competitive aspects in the enrolments of the first two college years. On the other hand, thousands of junior college students enter conventional liberal arts colleges at the third-year level, especially in the Middle and Far West junior colleges.

The Engineers' Council for Professional Development completed an examination of facilities for teaching engineering in 140 engineering colleges. A voluntary committee of engineering professors not only evaluated the engineering colleges as a whole but specifically approved some three-fourths of their departments. Of the resulting report, Professor Dugald C. Jackson said: "The need is for better-sifted engineering students in the engineering schools and an increased proportion of technical-institute students looking forward to the engineering trades."

Medical education during 1939 has endeavoured to perfect plans for post-graduate medical education that will improve the clinical work of specialists in the various fields of medicine.

Colleges of dentistry are watching with interest the announcement from Harvard of a program in dental education in which new emphasis is to be placed on the biological and medical aspects of training in dentistry, leading to a degree in dental medicine rather than in dental surgery as heretofore.

The American Association of University Professors and the Association of American Colleges (presidents) have given much consideration to formulation of a more definite set of principles fundamental to appointment and tenure.

In 1939, the National Resources Committee, after an extensive study of research funds available in the United States, reported that, of the total of \$200,000,000 expended, \$50,000,000 was expended for research in the universities.

The individual differences of students, their needs and capacities, continued to attract the interest of administrators at every level. Conditions of admission and graduation were made more flexible. Hundreds of colleges participated in one or more of the experimental programs in testing and selecting students for the widest range of activities including general education, vocational education and research.

BIBLIOGRAPHY.—*Depression, Recovery and Higher Education*, a report by Committee Y of the American Association of University Professors. The draft of this report was prepared by Malcolm M. Willey, University of Minnesota (New York, 1937); *The Student and His Knowledge*, Bulletin No. 29 (Carnegie Foundation for the Advancement of Teaching, New York, 1938); *The Proceedings of the Institute for Administrative Officers of Higher Institutions* (1939). (W. A. J.)

Great Britain.—The crises of 1938 were not misunderstood by the universities of Great Britain. During the year preceding the outbreak of war preparations for the preservation of university life, teaching and research were under constant consideration. Evacuation of universities from vulnerable areas, reserved occupations, specialist assistance in war time by members of university staffs, commandeering of university buildings, military training, postponement of military service, the selection of officers in all branches of the defence forces, precautions against air raids, the conservation of research teams and emergency legislation were a few of the numerous questions discussed and settled before the beginning of hostilities. In Sept. 1939 the universities of Great Britain were ready for any contingency. That forecasts of possible happenings at the outbreak of war did not materialize, in no way detracted from the smooth working of evacuation and other schemes for the preservation of university teaching—a national necessity acknowledged and commended by Government. The university chiefly affected by the evacuation plans was the University of London, of which most of the larger colleges were hospitably received by institutions in neutral or non-vulnerable areas; but other universities have plans in readiness should occasion arise.

During the year up to the outbreak of war universities had been proceeding with their program of development. In September, uncompleted schemes had either to be curtailed or abandoned. The year 1939, however, is a fresh reminder that the university, if it is to achieve the results for which it has been established, must be a dynamic and not a static institution, must be a "museum for record, a laboratory for discovery and a powerhouse of inspiration." At Birmingham the Barber Institute of Fine Art was opened. A new gymnasium and physics block should be available early in 1940. At the University of Bristol the dental hospital was nearing completion and the new science wing was already in partial occupation. The Universities of Durham, Leeds and Liverpool report reorganization of courses. At the University of Manchester a physical education centre was opened—an indication, here as elsewhere, of a new outlook on the functions of a university in relation to its students. The University of Reading as a receiving centre had to discontinue work on new buildings to house the departments of zoology and psychology. The department of glass technology of the University of Sheffield has been housed in a new building. The University of Wales was empowered to establish a faculty of architecture and its colleges extended their facilities for physical culture. Similarly in Scotland the physical welfare of students was a deep concern of all the universities. At Aberdeen a new sports pavilion and swimming pool was constructed; at Edinburgh a university certificate of physical ability was instituted; and at St. Andrews alterations were made to the university gymnasium. At all, including Glasgow, where a new ob-

servatory was opened, and the universities of Ireland, additional teaching posts in a number of scientific subjects were created. (See also CAMBRIDGE UNIVERSITY; LONDON UNIVERSITY; OXFORD UNIVERSITY.)

Canada.—The universities of Canada report the establishment of new chairs and the creation of new posts. At Laval university extensive improvements were made to the school of medicine. At McMaster university a contingent of the Canadian O.T.C. was organized and a St. John Ambulance brigade formed for women students. The Government of Iceland made the University of Manitoba a depository for all books printed in Iceland.

Australasia.—At the University of Adelaide the Institute of Medical and Veterinary Science was completed. The Universities of Melbourne, Tasmania and Western Australia report the construction of new buildings and the addition of posts. At the University of Sydney a chair of aeronautics was established. At Victoria university college, New Zealand, a department of political science and public administration was created.

South Africa.—The universities and colleges in South Africa added to their facilities for the recreation, residence and physical training of students, as well as for the study of and research in South African problems.

India.—Most of the Indian universities report changes in regulations, additional courses and the creation of new posts. Universities in India, no less than those in other parts of the world, are also paying increasing attention to the physical welfare of their students. At two universities, Aligarh Muslim university and Nagpur, compulsory military drill has been introduced.

Europe.—The outbreak of war in Sept. 1939 at once disorganized university teaching in many of the countries on the continent of Europe. In Germany the number of university teaching centres was reduced to six and university standards were lowered. In Poland the Universities of Warsaw and Cracow ceased to function as centres of Polish culture. In what was Czechoslovakia students were massacred. In Finland the University of Helsinki was partially destroyed by bombing. From Russia no report has been forthcoming. In Belgium the most important developments reported are from the University of Liège where a school of criminology was created. Reciprocal postgraduate scholarships were arranged with British universities. Similar arrangements were made between British and French universities. In Bulgaria public funds were made available for poor students. In Denmark, in the Universities of Copenhagen and Aarhus additions were made to the teaching staffs in theology, medicine, sociology and comparative literature. The Italian Government increased the number of scholarships on a reciprocal basis to students of other countries. A chair of aerology was established in the University of Rome. At the University of Vytautas the Great in Lithuania large clinics were completed and equipped. In Spain, with a record number of matriculated students, the University of Madrid was reopened. By the removal of the ban on teaching by members of religious orders a large increase in the number of women students was recorded. In Turkey the number of students at the University of Istanbul has now risen to 7,135. Facilities for study and research have been greatly extended.

South America.—In the Argentine a new national university was founded at Cuyo to give special attention to the study of modern languages and to English in particular. In Peru a chair of English was established in the Universidad Mayor de San Marcos.

The following seven pages carry a selected list of universities and colleges in the U.S. and Canada, with location, year founded, chief executive, enrolment, size of faculty, endowment and number of library volumes, for the academic year 1939-40. An asterisk denotes 1938-39 data.

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Volumes	Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Volumes
A															
Abilene Christian College, Abilene, Tex.	1906	James F. Cox	821	1,539	42	\$ 335,200	14,501	Bessie Tift College, Forsyth, Ga.	1847	C. L. McGinty	227	237	23	\$ 210,000	12,000
Abraham Baldwin Agr. Col., Tifton, Ga.	1933	George H. King	402	461	19	—	10,501	Bethany College, Bethany, W. Va.	1849	W. H. Cramblet	380	397	35	2,221,152	31,102
Adams St. Tech. Col., Alamosa, Colo.	1921	Ira Richardson	199	281	14	—	13,001	Bethany College, Lindsborg, Kan.	1881	Ernst F. Philblad	202	230	35	362,616	10,700
Adelphi College, Garden City, N. Y.	1896	Paul Dawson Eddy	478	480	32	43,150	32,801	Bethany-Peniel College, Bethany, Okla.	1881	A. C. Bracken	289	301	22	22,061	8,721
Adrian College, Adrian, Mich.	1815	Harlan L. Freeman	178	280	62	1,594,237	19,000	Bethel College, McKenzie, Tenn.	1842	Ewell K. Rengin	150	200	14	400,000	10,000
Agnes Scott College, Decatur, Ga.	1889	James R. McCain	486	480	62	1,637,000	34,000	Bethel College, Newton, Kan.	1887	Edmund G. Kaufman	314	341	32	318,000	20,000
Akron, Univ. of, Akron, Ohio	1879	H. E. Shumons	1,630	3,950	110	153,421	34,370	Bethel Institute, St. Paul, Minn.	1871	G. Arvid Hagstrom	160	170	15	28,443	18,000
Alabama College, Montevallo, Ala.	1896	A. F. Harman	807	875	75	553,722	59,000	Bethel Woman's Col., Hopkinsville, Ky.	1854	W. W. Gaines	160	170	22	38,000	7,000
Alabama Polytechnic Inst., Auburn, Ala.	1892	Luther N. Duncan	3,425	3,500	135	282,600	60,000	Bethune-Cookman Col., Daytona Beach, Fla.	1904	Mary McL. Bethune	501	521	22	66,914	6,050
Ala. State Teachers Col., Jacksonville, Ala.	1872	J. A. Keller	688	1,431	42	—	33,000	Bilmore College, Asheville, N. C.	1907	A. Lloyd	150	180	11	39,000	3,000
Ala. State Teachers Col., Florence, Ala.	1883	N. F. Greenhill	437	476	29	—	19,580	Birmingham-South. Col., Birmingham, Ala.	1856	Raymond R. Paly	368	387	62	750,000	46,000
Ala. State Teachers Col., Livingston, Ala.	1883	H. C. Trenholm	1,336	2,130	79	4,875,123	11,020	Bishop College, Marshall, Texas	1881	Joseph J. Rhoads	619	627	36	1,816	15,000
Ala. State Teachers Col., Montgomery, Ala.	1884	Richard C. Foster	5,499	7,236	47	—	220,568	Blackburn College, Carle Place, Ill.	1837	W. M. Hudson	310	320	21	1,000,000	12,000
Alabama, University of, University, Ala.	1831	Charles E. Bunnell	5,499	7,236	47	—	220,568	Blackstone College for Girls, Blackstone, Va.	1882	J. P. Gleck	197	210	10	59,000	3,411
Alaska, University of, University, Alaska	1917	W. A. R. Kerr	1,719	2,175	23	607,601	17,000	Blackwell College, Brentham, Texas	1883	C. F. Schmidt	353	373	23	—	—
Alberta, Univ. of, Edmonton, Alta., Can.	1905	Sister M. Isabel	186	310	38	500,000	14,500	Blue Mountain Col., Bluefield, W. Va.	1895	Henry L. Dickason	297	400	28	381,500	12,500
Albertus Magnus Col., New Haven, Conn.	1835	John L. Seaton	795	860	53	1,795,837	52,847	Blue Ridge College, New Windsor, Md.	1873	Lawrence T. Lowrey	400	460	25	108,000	12,500
Albion College, Albion, Mich.	1835	Raymond H. Snyder	330	330	25	—	11,000	Bob Jones College, Cleveland, Tenn.	1900	Homer E. Ramseyer	212	217	25	108,000	12,500
Albion State Normal School, Albion, Ida.	1893	Harry W. Masters	380	624	32	610,332	20,000	Boston College, Boston, Mass.	1926	R. M. (John) Jones	500	525	30	9,243	9,243
Albright College, Reading, Pa.	1850	William H. Bell	511	511	32	200,371	9,419	Boston University, Boston, Mass.	1863	Wm. J. Murphy	2,407	2,807	331	5,124,508	180,000
Alcorn Agr. & Mech. Col., Alcorn, Miss.	1871	John W. Elliott	143	313	18	45,000	6,000	Bowling Green St. Univ., Bowling Green, O.	1896	Frederic R. Hamilton	1,402	1,885	101	3,133,126	46,071
Alderson-Brooks Col., Philippi, W. Va.	1836	J. Nelson Norwood	631	950	85	1,088,000	55,050	Bowling Polytechnic Inst., Peoria, Ill.	1869	John R. C. Evans	169	186	19	100,000	12,000
Alfred University, Alfred, N. Y.	1815	William P. Tolley	653	804	59	1,436,068	125,000	Breadalban College, Brandon, Man., Canada	1878	H. J. Pearce, Sr.	373	443	32	53,779	13,000
Allegheny College, Meadville, Pa.	1815	Richard R. Higgins	319	320	28	37,500	13,013	Brenau College, Gainesville, Ga.	1878	E. J. Coltrane	466	491	35	61,855	7,000
Allen University, Columbia, S. C.	1870	John W. Dunning	495	405	40	700,000	50,000	Brevard College, Brevard, N. C.	1879	Minnie C. Keley	49	49	15	3,910	3,910
Alma College, Alma, Mich.	1886	P. S. Dobson	150	275	22	12,000	7,100	Bridgeport City Norm. Sch., Bridgeport, Conn.	1880	Paul H. Bowman	262	283	30	511,818	15,000
Alma College, St. Thomas, Ont., Can.	1877	Arthur K. White	20	30	39	261,801	23,018	Brigham Young University, Provo, Utah	1880	Franklin S. Harris	2,704	3,390	159	27,109	115,000
Alma White College, Zarephath, N. J.	1921	Chester S. McGown	606	173	17	—	17,000	British Columbia, Univ. of, Vancouver, B. C.	1875	Leonard S. Klinek	2,476	3,170	287	67,500	121,000
American Inter. Col., Springfield, Mass.	1895	Frederick H. Clapp	103	173	17	957,744	46,248	Brooklyn Polytechnic Inst., Brooklyn, N. Y.	1854	Henry S. Rogers	626	626	145	1,700,000	24,410
American University, Washington, D. C.	1863	Joseph M. M. Gray	399	1,784	103	11,954,000	227,612	Brown University, Providence, R. I.	1784	Marion E. Park	2,143	2,533	209	11,785,927	559,000
Amherst College, Amherst, Mass.	1821	Stanley King	874	901	79	—	6,000	Bryn Mawr College, Bryn Mawr, Pa.	1885	Anna C. Marts	567	635	104	6,908,000	103,500
Amherst College, Amherst, S. C.	1910	Annie D. Denmark	214	351	30	—	4,000	Bucknell University, Lewisburg, Pa.	1846	Henry Olson	1,227	1,671	80	1,387,523	94,700
Andrew College, Culberty, Ga.	1854	S. C. Olliff	720	751	100	50,000	54,000	Buena Vista College, Storm Lake, Iowa	1801	Samuel P. Capen	452	687	37	250,000	19,400
Antioch College, Yellow Springs, Ohio	1853	A. D. Henderson	901	901	44	50,000	22,000	Butler University, Indianapolis, Ind.	1850	Daniel S. Robinson	1,608	5,207	708	5,657,605	149,077
Appalachian St. Teachers Col., Boone, N. C.	1893	B. B. Dougherty	2732	2,873	224	—	7,000								
Arizona, University of, Tucson, Ariz.	1885	Alfred Atkinson	373	933	59	—	13,000								
Ark. Agr. Mech. & Norm. Col., Little Rock, Ark.	1883	John Brown Watson	200	210	16	11,873	13,000								
Arkansas Baptist College, Little Rock, Ark.	1874	T. W. Cogges	200	210	16	11,873	13,000								
Arkansas College, Batesville, Ark.	1892	F. M. Lowry, Jr.	120	203	14	—	13,000								
Arkansas Polytechnic Col., Russellville, Ark.	1879	T. M. Hull	714	710	27	—	11,344								
Arkansas State College, Jonesboro, Ark.	1902	V. C. Kays	597	1,024	45	—	12,000								
Armour Institute of Tech., Chicago, Ill.	1892	Henry T. Heald	1,374	3,336	120	400,000	50,000								
Arostook St. Norm. Sch., Presque Isle, Me.	1903	S. L. Merriman	157	—	9	—	3,750								
Ashland College, Ashland, Ohio	1887	Frank C. Foster	470	501	27	15,257	15,257								
Ashland College, Athens, Ala.	1878	Edward C. Mason	375	440	38	—	16,500								
Atlanta University, Atlanta, Ga.	1862	E. R. Naylor	387	486	20	410,622	16,500								
Atlantic Christian College, Wilson, N. C.	1892	Rufus E. Clement	73	115	41	200,000	14,324								
Atlantic Union Col., So. Lancaster, Mass.	1882	Howard S. Hilley	378	771	25	3,476,048	62,000								
Augsburg Col. & Sem., Minneapolis, Minn.	1869	G. Eric Jones	285	303	27	350,747	12,773								
Augustana College & Theological Seminary, Rock Island, Ill.	1860	Bernhard Christensen	441	447	35	73,951	18,500								
Aurora College, Aurora, Ill.	1860	Conrad Bergendoff	617	1,142	50	1,304,280	74,811								
Austin Peay Norm. Sch., Clarksville, Tenn.	1912	Theodore P. Stephens	180	210	21	75,000	23,500								
Averett College, Danville, Va.	1859	P. P. Claxton	581	618	24	—	9,000								
Avery Institute, Charleston, S. C.	1895	Curtis V. Bishop	106	318	22	71,650	4,000								
		Frank A. DeCosta	450	450	20	—	—								
B															
Baker University, Baldwin City, Kan.	1858	Nelson P. Horn	416	421	30	1,328,622	65,000								
Baldwin-Wallace College, Berea, Ohio	1818	Louis C. Wright	666	850	57	1,724,189	25,000								
Bail State Teachers College, Muncie, Ind.	1915	L. A. Pittenger	1,566	1,757	107	—	74,000								
Bates College, Lewiston, Me.	1864	Clifton D. Gray	700	700	57	1,875,153	72,038								
Baylor University, Waco & Dallas, Tex.	1845	Pat M. Neff	2,758	2,926	31	1,949,703	126,062								
Beaver College, Jenkintown, Pa.	1853	James E. Mooney	623	628	66	75,000	10,000								
Beckley College, Beckley, W. Va.	1893	J. L. Bumgardner	360	550	41	—	11,000								
Belhaven College, Jackson, Miss.	1891	G. T. Gillespie	271	311	30	100,000	50,000								
Belmont Abbey College, Belmont, N. C.	1878	Cuthbert E. Allen	108	201	31	—	10,000								
Beloit College, Beloit, Wis.	1816	Irving Maurer	601	601	51	2,200,581	95,878								
Bennett College, Columbia, S. C.	1876	J. J. Starks	376	307	28	140,000	25,000								
Bennett College, Greensboro, N. C.	1873	David D. Jones	309	315	20	354,155	10,002								
Birmingham College, Birmingham, Ala.	1857	Robert D. Leigh	276	270	48	100,001	18,062								
Berry College, Berry, Ky.	1855	Francis S. Hutchins	812	813	67	5,218,200	85,181								
Berry College and Schools, Mt. Berry, Ga.	1902	Martha Berry	1,250	1,250	150	—	10,458								

Institution and Location	Year Began	Year Closed	Year Reopened	Year of Foundation	Endowment	Chief Executive	Institution and Location	Year Began	Year Closed	Year Reopened	Year of Foundation	Endowment	Chief Executive
Cherokee Ind. Norm. Sch., Pembroke, N.C.	1888					G. G. Maudslow	Duquesne College, Philadelphia, Pa.	1897				1,097	Cyrus Adler
Chesnut Hill, Ind. Col., Chestnut Hill, Pa.	1898					Madeline Mary James	Duquesne College, Springfield, Mo.	1897				187	Thomas W. Nuland
Chesney Tr. Sch., Fort Totten, Cheyenne, Wyo.	1897					Leslie Pinckney Hill	Duquesne College, University of Duquesne, Pa.	1897				1,113,273	Dale D. Welch
Chicago State College, Chicago, Ill.	1890					Robert M. Hutchins	Duquesne College, University of Duquesne, Pa.	1897				720,138	Madeline Mary James
Chickasha College, Chickasha, Okla.	1887					Amyer Jay Hamilton	Duquesne College, University of Duquesne, Pa.	1897				31,107,617	William F. Fox
Chickasha State College, Chickasha, Okla.	1887					James C. Miller	Duquesne College, University of Duquesne, Pa.	1897				3,101	Herbert Stevenson
Chickasha State College, Chickasha, Okla.	1887					Raymond Waller	Duquesne College, University of Duquesne, Pa.	1897				3,101	J. J. Callahan
Chickasha State College, Chickasha, Okla.	1887					C. P. Sumner	Duquesne College, University of Duquesne, Pa.	1897				3,101	Sister Grace
Chickasha State College, Chickasha, Okla.	1887					William W. Wright	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Russell M. Stow	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Walter W. Atwood	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					James M. A. Dunkin	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					James S. Thomas	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					P. Roger Henry	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					George W. Sikes	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					W. W. Bice	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Hasty M. Gage	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					C. Spivey Green	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Franklin W. Johnson	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					George H. Cullen	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Thurston J. Davies	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					M. F. Connelley	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Charles A. Lary	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					George W. Frazer	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Robert L. Stearns	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					F. E. Hutchings	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					H. F. Lenn	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					E. Caldwell Gullis	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Stephen Schaeffer	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Joseph F. March	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					L. E. Puerling	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Arthur W. Kline	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Charles F. Brunner	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Albert N. Jorgensen	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Katharine Hunt	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Herbert D. Wells	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Edw. M. Goodhue	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					John B. Mager	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Katharine B. Day	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					H. DeW. DeForest	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					John P. Zuercher	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					W. H. McDonald	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Ernest L. Stockton	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Joseph H. Edgar	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Colleton Stanley	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					L. S. Sierbeck	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Ralph C. Jenkins	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Thomas H. Hart	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Ernest M. Hopkins	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Walter Lee Lingo	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Chas. E. Albert	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					John A. Albert	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					John Willert Chaston	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Walter Hallgren	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					William M. Kethley	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Avery A. Shaw	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					David Shaw Duncan	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					M. J. O'Connell	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Francis J. MacLennan	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					T. Paul Hickey	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Charles H. Chond	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Fred P. Corson	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Walter S. Steiner	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					William Stuart Nelson	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Sister Mary Vincent	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					D. W. Morehouse	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Arlo Ayres Brown	Duquesne College, University of Duquesne, Pa.	1897				3,101	
Chickasha State College, Chickasha, Okla.	1887					Packer E. Kollas	Duquesne College, University of Duquesne, Pa.	1897				3,101	

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Library Volumes
Ga. State Col. for Women, Milledgeville, Ga.	1889	Guy H. Wells	1,460	1,460	137	\$	11,032
Ga. State Women's Col., Valdosta, Ga.	1906	Frank R. Reade	358	360	25	—	10,731
Georgia, University of, Athens, Ga.	1828	Henry W. A. Hanson	3,748	5,418	441	928,051	133,000
Gettysburg College, Gettysburg, Pa.	1832	Henry W. A. Hanson	600	501	45	815,000	394,750
Glenville St. Ch. Col., Glenville, W. Va.	1892	Edward G. Rohrbough	501	501	23	—	1,404,167
Gonzaga University, Spokane, Wash.	1887	Leo J. Robinson	604	1,011	43	—	20,000
Gorham Normal School, Gorham, Me.	1879	S. C. V. E. Russell	370	370	33	—	20,000
Goshen College, Goshen, Ind.	1894	D. A. Robertson	320	488	24	125,000	26,320
Goucher College, Baltimore, Md.	1885	David A. Robertson	596	603	69	2,450,141	280,000
Graceland College, Lamoni, Iowa	1895	G. N. Briggs	509	388	23	2,435,445	113,861
*Great Falls Norm. Col., Great Falls, Mont.	1892	J. A. Kearney	448	288	30	—	534,500
Greenbrier College, Lewisburg, W. Va.	1868	Frederick W. Thompson	371	418	20	450,632	31,000
Greenbrier College, Greensboro, N. C.	1888	Frederick W. Thompson	371	418	20	450,632	4,970
Greenville College, Greenville, Ill.	1892	Frederick W. Thompson	371	418	20	450,632	—
Grinnell College, Grinnell, Iowa	1846	H. J. Long	557	263	23	122,000	5,725
Grove City College, Grove City, Pa.	1876	John S.ollen	729	730	67	2,104,106	31,000
Gulfport College, Gulfport, Miss.	1887	Veir C. Ketter	913	937	51	785,214	20,000
Gustavus Adolphus Col., St. Peter, Minn.	1887	Clyde A. Milner	387	387	29	632,026	20,000
	1892	O. J. Johnson	597	571	39	541,904	20,000
H							
Hamilton College, Clinton, N. Y.	1812	W. H. Cowley	451	451	45	4,546,646	30,014
Hamline University, St. Paul, Minn.	1854	Charles Nelson Pace	651	650	40	1,951,056	122,653
Hampden-Sydney Col., Hamp. Sydney, Va.	1775	E. G. Gammon	301	391	21	371,597	61,851
Hampson Institute, Hampton, Va.	1868	Arthur Howe	978	1,000	125	10,332,688	390,700
Hanibal-LaGrange Col., Hannibal, Mo.	1858	Andrew F. Morris	160	190	17	50,000	21,000
Hanover College, Hanover, Ind.	1847	Albert G. Parker, Jr.	1,168	1,168	41	1,250,000	21,000
Hardin-Simmons Univ., Abilene, Tex.	1891	J. Davis Smider	370	370	24	800,000	21,000
Hartford College, Hartford, Conn.	1844	George S. Varnest	450	490	32	—	21,000
Harris Teachers College, St. Louis, Mo.	1857	Charles G. Varnest	310	310	22	10,000	21,000
Hartwick College, Oneonta, N. Y.	1836	J. H. Arnold	201	300	25	140,185,706	21,000
Harvard University, Cambridge, Mass.	1636	James B. Conant	8,370	8,370	1,084	4,442,037	69,561
Hastings College, Hastings, Neb.	1882	John W. Creighton	513	530	47	722,071	21,000
Haverford College, Haverford, Pa.	1833	Wm. Wistar Comfort	327	327	50	4,442,037	21,000
Hawaii, University of, Honolulu, Hawaii	1897	David L. Crawford	2,069	3,971	170	33,395	21,000
Hebrew Union College, Cincinnati, Ohio	1875	Julian Morgenstern	68	68	17	2,400,000	21,000
Heidelberg College, Tiffin, Ohio	1850	Clarence E. Josephson	339	425	33	997,576	21,000
Hendrix College, Conway, Ark.	1854	John Hugh Reynolds	413	418	40	102,502	21,000
Henson Col. & Bible Sch., Henson, Kan.	1884	John Hugh Reynolds	413	418	40	102,502	21,000
High Point College, High Point, N. C.	1924	Guion I. Humphreys	432	720	30	200,000	21,000
Hillman College, Clinton, Miss.	1884	Willford O. Nauk	309	448	35	815,338	21,000
Hillsdale College, Hillsdale, Mich.	1844	Willford O. Nauk	335	335	28	1,108,870	21,000
Hiram College, Hiram, Ohio	1850	Kenneth I. Brown	225	225	14	77,717	21,000
Holabird College, Madisonville, Tenn.	1819	Thomas A. Frick	361	361	54	1,353,217	21,000
Holbert College, Geneva, New York	1842	Bessie C. Randolph	324	331	40	444,820	21,000
Hollins College, Hollins College, Va.	1842	Joseph R. N. Maxwell	1,286	1,286	90	—	21,000
Holy Cross, Col. of the, Worcester, Mass.	1863	Sister Mary Aloys	320	406	33	50,000	21,000
Holy Names College, Spokane, Wash.	1886	Sister Esther Mary	160	281	18	309,178	21,000
Hood College, Frederick, Md.	1863	Henry J. Stair	458	588	38	825,000	21,000
Hop College, Holland, Mich.	1866	W. W. Wickers	462	466	36	238,155	21,000
Houghton Col. for Negroes, Houghton, N. Y.	1833	Stephen W. Paine	435	435	24	—	21,000
Houston, University of, Houston, Tex.	1927	Edison E. Oberholtzer	576	2,407	56	735,000	21,000
Howard College, Birmingham, Ala.	1834	Harwell G. Davis	664	1,400	50	540,000	21,000
Howard Payne College, Brownwood, Tex.	1869	Thomas H. Taylor	778	1,372	38	979,098	21,000
Howard University, The, Washington, D.C.	1867	M. W. Johnson	7,000	11,277	603	—	21,000
Hunter College, New York, N. Y.	1870	Eugene A. Colligan	320	408	33	400,000	21,000
Huntington College, Montgomery, Ala.	1854	Hubert Searcy	110	204	22	330,000	21,000
Huntington College, Huntington, Ind.	1866	Vicant	229	277	22	835,688	21,000
Huron College, Huron, S. D.	1833	Milton C. Townner	420	500	26	555,000	21,000
I							
Iaho, The College of, Caldwell, Ida.	1891	William W. Hall, Jr.	1,066	1,115	68	—	21,000
Iowa, The College of, Des Moines, Iowa	1846	Harrison C. Dale	2,812	2,812	200	2,599,934	21,000
Iowa State Normal Univ., Normal, Ill.	1849	H. Gary Hudson	385	385	26	1,138,831	21,000
Illinois, University of, Urbana, Ill.	1857	R. W. Fairchild	1,045	1,045	201	—	21,000
Illinois Wesleyan Univ., Bloomington, Ill.	1867	Arthur C. Willard	17,074	17,000	21,15	1,115,746	21,000
Immaculate Conc. Sem. Huntington, L.N.Y.	1856	William E. Shaw	650	603	54	1,333,000	21,000
Immaculate Heart Col., Los Angeles, Calif.	1906	Patrick J. Barry	168	168	10	—	21,000
Incarinate Word Col., San Antonio, Tex.	1900	Sister M. Eucharistia	401	401	25	52,000	21,000
		Sister M. Columkille	455	536	46	1,141,812	21,000
J							
Jacksonville College, Jacksonville, Tex.	1899	John W. Overall	65	75	5	32,533	21,000
James Millikin University, Decatur, Ill.	1901	John C. Hesser	650	813	57	1,000,000	21,000
James Ormond Wilson Tech. Col., Wash., D.C.	1873	Edgar C. Higbie	480	531	48	—	21,000
Jamestown College, Jamestown, N. D.	1883	B. H. Kroez	381	434	31	1,068,970	21,000
John B. Stetson University, Deland, Fla.	1883	William S. Allen	793	730	72	909,010	21,000
John Carroll University, Cleveland, Ohio	1886	Edmund C. Horne	660	650	52	1,735,000	21,000
John Brown Univ., Siloam Springs, Ark.	1919	John E. Brown	371	381	50	—	21,000
Johns Hopkins Univ., Baltimore, Md.	1876	Isaiah Bowman	1,618	4,731	587	30,387,106	534,850
Johnson C. Smith Univ., Charlotte, N. C.	1867	Henry L. McGrorey	330	331	20	1,730,128	21,000
Judson College, Marion, Ala.	1838	L. G. Cleveland	333	360	34	—	21,000
Junata College, Huntington, Pa.	1876	Charles C. Ellis	432	520	44	710,693	21,000
K							
Kalamazoo College, Kalamazoo, Mich.	1833	Paul L. Thompson	374	383	30	1,330,309	30,014
Kan. State Col. of Agr., Manhattan, Kan.	1863	Francis D. Farrell	4,200	5,000	325	595,599	122,653
Kan. State Teachers Col., Pittsburg, Kan.	1893	Wm. A. Brandenburg	2,630	350	150	—	61,851
Kansas, University of, Lawrence, Kan.	1865	Deane W. Malott	5,500	257	207	256,000	390,700
Kansas Wesleyan University, Salina, Kan.	1885	Edgar K. Morrow	902	311	20	—	21,000
Keene Teachers College, Keene, N. H.	1909	L. P. Young	334	334	52	—	21,000
Kent State University, Kent, Ohio	1910	K. C. Leebick	2,550	2,800	135	—	21,000
Ky. State Col. for Negroes, Frankfort, Ky.	1886	Rufus B. Atwood	560	1,212	46	—	21,000
Kentucky Wesleyan Col., Winchester, Ky.	1865	Frank L. McVey	3,426	5,000	330	181,075	251,000
Kenyon College, Gambier, Ohio	1860	Paul Shell Powell	171	180	16	69,000	56,935
Kenyon College, Keuka Park, N. Y.	1824	Gordon K. Chalmers	300	300	40	1,728,273	59,000
King College, Bristol, Tenn.	1867	Joseph Hillis Miller	212	233	29	304,085	19,439
Knox College, Galesburg, Ill.	1837	Thomas P. Johnston	203	250	17	139,000	21,589
Knox College, Toronto, Ont., Canada	1837	Carver Davidson	593	600	55	2,424,583	55,453
Knoxville College, Knoxville, Tenn.	1838	Rev. Thomas Eakin	65	88	3	377,246	31,000
Kutztown State Tech. Col., Kutztown, Pa.	1875	Samuel M. Lehigh	267	282	34	806,363	17,000
	1866	Q. A. W. Rohrbach	492	765	30	—	—
L							
La Crosse State College, La Crosse, Wis.	1909	Rexford S. Mitchell	788	806	55	—	21,500
Lafayette College, Easton, Pa.	1824	William M. Lewis	961	—	101	3,013,580	100,000
LaGrange College, LaGrange, Ga.	1831	Hubert T. Quillian	141	180	17	258,000	10,516
Lake Erie College, Painesville, Ohio	1856	Vivian B. Small	172	102	27	859,341	28,000
Lake Forest College, Lake Forest, Ill.	1857	Herbert M. Moore	370	386	27	1,357,000	40,870
Lamar College, Beaumont, Tex.	1923	C. W. Winkman	408	548	10	—	3,172
Lambuth College, Jackson, Tenn.	1924	R. E. Womack	205	205	20	9,105	5,000
Lander College, Greenwood, S. C.	1872	John F. Speake	381	453	36	3,424,559	16,000
Lane College, Jackson, Tenn.	1882	James F. Lane	512	821	21	2,430,600	90,100
LaVerne University, LaVerne, Calif.	1891	C. Ernest Davis	3,251	4,110	274	35,318	20,000
Lawrence College, Appleton, Wis.	1866	Thomas N. Barrows	609	712	65	1,348,334	61,301
Lebanon Valley College, Annville, Pa.	1866	Clyde A. Lynch	409	570	35	918,312	21,577
Lehigh University, Bethlehem, Pa.	1865	Clement C. Williams	1,893	1,765	210	7,900,000	238,000
Leland College, Baker, La.	1870	John A. Bacalos	351	381	19	125,000	5,000
LeMay College, Memphis, Tenn.	1880	Frank Sweeney	318	304	24	—	15,000
Lenoir-Rhyne College, Hickory, N. C.	1891	P. E. Monroe	570	909	25	425,000	16,031
Lesley Normal School, Cambridge, Mass.	1909	Edith L. Wolfard	440	117	21	—	4,000
Lewis Institute, Chicago, Ill.	1893	F. A. Rogers	800	3,153	100	1,417,039	38,000
Lewiston State Norm. Sch., Lewiston, Ida.	1893	John E. Turner	424	424	34	465,000	15,300
Lincoln College, Gaffney, S. C.	1893	R. C. Granberry	335	339	36	250,000	17,500
Lincoln Institute, Lincoln, R. I.	1893	William D. Copeland	135	135	13	4,500	10,000
Lincoln Memorial Univ., Harrogate, Tenn.	1897	Shirley M. Young	286	286	13	230,381	4,500
Lincoln University, Jefferson City, Mo.	1866	S. W. McGlelland	409	501	30	830,011	17,767
Lincoln University, Lincoln Univ., Pa.	1854	Walter L. Wright	488	488	32	—	16,000
Lincolnwood College, St. Charles, Mo.	1827	John D. Roegner	387	390	27	1,050,773	35,000
Linfield College, McMinnville, Ore.	1857	Wm. G. Everson	476	486	50	2,100,000	25,000
Livingstone College, Salisbury, N. C.	1882	William J. Trent	302	302	16	46,500	16,850

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Library Volumes	Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Library Volumes
Long Morris College, Brooklyn, N. Y.	1916	Tristram W. Metcalfe	761	941	53	\$ 500,000	15,000	Middlebury College, Middlebury, Vt.	1800	Paul Dwight Moody	799	799	65	\$ 4,400,000	110,000
Loras College, Dubuque, Iowa	1873	C. E. Peoples	286	346	14	102,592	6,300	Middlesex University, Boston, Mass.	1849	C. R. Smith	535	535	85	—	6,000
Loretto Heights College, Loretto, Colo.	1918	M. J. Martin	875	955	70	1,150,000	92,000	Midland College, Fremont, Neb.	1887	W. A. Bell	480	480	21	135,300	18,500
Louisiana College, Louisiana, N. C.	1779	Paul J. Kettick	155	305	30	750,000	14,200	Miles Memorial College, Birmingham, Ala.	1902	W. A. Bell	345	345	21	—	6,000
Louisiana College, Pineville, La.	1906	Walter Patton	308	313	22	100,000	5,750	Millersville St. Coll., Millersville, Pa.	1884	L. J. D. Tucker	530	530	66	—	26,769
Louisiana Polytechnic Inst., Ruston, La.	1884	Claybrook Cotttingham	459	533	22	310,000	11,095	Milligan College, Milligan, Tenn.	1852	H. J. D. Tucker	399	399	21	123,000	15,000
La. State Norm. Coll., Natchitoches, La.	1884	E. S. Richardson	2,029	2,049	110	—	37,200	Missisquoi College, Jackson, Miss.	1891	Aurelia H. Reinhardt	594	594	100	1,010,677	79,224
Louisiana State Univ., Baton Rouge, La.	1860	Paul M. Hebert	1,527	1,527	100	—	29,057	Missouri College, Oakland, Calif.	1891	W. L. Smith	594	594	100	800,441	25,000
Louisiana Textile Institute, Baton Rouge, La.	1880	Charles H. Eames	8,425	8,425	771	—	247,370	Mississippi College, Clinton, Miss.	1807	J. N. Daland	168	168	19	210,650	15,000
Lowell College, Baltimore, Md.	1852	Edward B. Dunn	302	1,946	37	1,375,000	2,720	Mississippi State College, Natchez, Miss.	1848	Oscar Werwath	317	317	340	—	600
Loyola College, Chicago, Ill.	1862	Samuel K. Wilson	4,530	4,685	720	1,577,518	30,000	Mississippi State College, Natchez, Miss.	1848	Charles R. Suttage	414	414	500	—	18,426
Loyola University, Los Angeles, Calif.	1865	Chas. A. McQuillan	700	700	55	—	34,000	Mississippi State College, Natchez, Miss.	1848	Frank D. McElroy	333	333	37	—	22,000
Loyola University, New Orleans, La.	1865	Percy A. Roy	983	2,600	165	2,935,013	67,000	Mississippi State College, Natchez, Miss.	1848	Guy Stanton Ford	261	261	23	1,100,000	16,000
Luther College, Decorah, Iowa	1861	O. J. H. Preus	404	410	40	643,000	72,000	Mississippi State College, Natchez, Miss.	1848	Sister Mary Bormeo	1065	1065	1065	15,051	1,050,000
Lynchburg College, Lynchburg, Va.	1903	R. B. Montgomery	245	260	21	295,235	17,088	Mississippi State College, Natchez, Miss.	1848	Paul Grosshuesch	385	385	24	633,041	22,000
M															
MacLester College, St. Paul, Minn.	1873	Charles J. Turck	689	703	49	1,807,726	30,000	Miss. State Coll. for Women, Columbus, Miss.	1912	J. B. George	625	625	53	—	55,000
MacMurray College, Jacksonville, Ill.	1816	C. P. McClelland	606	779	55	1,867,000	27,632	Miss. State Coll. for Women, Columbus, Miss.	1912	A. E. Butts	1,398	1,398	115	733,868	68,515
McGill University, Montreal, Canada	1821	Lewis W. Douglas	3,018	3,275	554	20,374,020	394,050	Miss. State Coll. for Women, Columbus, Miss.	1912	W. E. Holcomb	153	153	20	503,000	13,150
McKendree College, Lebanon, Ill.	1828	Clark R. Yost	173	239	20	265,000	14,500	Missouri, University of, Columbia, Mo.	1839	F. A. Middlebush	5,636	5,636	378	1,022,000	393,000
McMaster Univ., Hamilton, Ont., Can.	1827	H. P. Whidden	557	1,004	42	1,759,010	13,000	Missouri Valley College, Marshall, Mo.	1888	Thomas W. Bibb	276	276	300	612,000	20,000
McMurry College, Abilene, Texas	1923	Frank L. Turner	412	650	31	56,000	13,000	Monmouth College, Monmouth, Ill.	1853	Grace K. Ramsay	162	162	15	10,000	5,440
McPherson College, McPherson, Kan.	1878	Vernon F. Schwalm	400	535	26	402,504	13,000	Montana State College, Bozeman, Mont.	1893	James Harper Grier	510	550	43	1,806,449	60,000
Madawaska Tr. Sch., Fort Kent, Me.	1887	R. F. Crocker	159	159	10	—	3,000	Montana State College, Bozeman, Mont.	1893	Francis A. Thomson	336	336	21	800,000	16,200
Madison College, Madison College, Tenn.	1904	E. A. Sutherland	2,063	2,610	33	1,000,000	23,000	Montana State Normal Coll., Dillon, Mont.	1893	A. L. Strand	1,636	1,636	109	—	60,000
Maine, University of, Orono, Me.	1865	Arthur A. Hawk	606	779	55	1,867,000	27,632	Montana State Normal Coll., Dillon, Mont.	1893	Sheldon E. Davis	293	293	20	—	21,185
Manchester College, No. Manchester, Ind.	1889	Ohio Winger	2,063	2,610	33	1,000,000	23,000	Montana State Normal Coll., Dillon, Mont.	1893	George F. Simmons	2,890	2,890	91	150,000	26,695
Manhattan College, New York, N. Y.	1863	Brother A. Victor	1,201	1,201	100	995,833	35,000	Montreal University, Montreal, Canada	1897	Mgr. Olivier Maurault	7,862	7,862	815	—	53,000
Manhattanville Coll. of Soc. Wrk., N. Y.	1847	Grace C. Robinson	352	374	53	—	29,050	Mohead St. Coll., Moorhead, Minn.	1897	Ray B. MacLean	681	700	52	250,000	20,000
Manitoba Law Sch., Winnipeg, Man., Can.	1914	Lester K. Ade	58	58	12	—	2,800	Moravian Sem. & Coll. for Women, Beth, Pa.	1807	W. N. Schwarze	186	200	22	950,000	25,000
Mansfield State Tch. Coll., Mansfield, Pa.	1862	Ruby V. Perry	68	615	65	—	24,401	Moravian Sem. & Coll. for Women, Beth, Pa.	1807	Edwin J. Heath	278	305	40	225,760	8,500
Margaret C. Hanson Norm. Sch., N. Orins, La.	1895	Mother M. Clarissa	38	48	7	1,291,884	11,500	Morningside College, Des Moines, Iowa	1867	H. O. Holmes	518	592	35	81,089	25,220
Marian College, Oldenburg, Ind.	1860	Harry Kelo Eversall	416	424	38	75,000	10,900	Morris Brown University, Atlanta, Ga.	1891	Earl A. Roadman	639	639	26	327,260	43,500
Marion College, Marion, Ind.	1920	Wm. F. McConn	225	239	18	—	7,500	Morris Harvey College, Charleston, W. Va.	1881	Leonard Rigleman	408	408	14	200,000	10,000
Marquette University, Milwaukee, Wis.	1873	Hugh J. Rhyne	123	138	16	—	7,500	Morris Harvey College, Charleston, W. Va.	1881	George J. Trueman	200	210	14	50,000	20,000
Marshall College, Marshall, W. Va.	1881	R. C. McCarthy	3,200	4,008	403	2,458,960	97,476	Mount Allison Univ., Sackville, N. B., Can.	1887	James Kossler	210	300	20	1,010,746	43,040
Marshall College, Marshall, W. Va.	1881	R. C. McCarthy	3,200	4,008	403	2,458,960	97,476	Mount Allison Univ., Sackville, N. B., Can.	1887	Roswell G. Ham	1,060	1,060	135	5,261,202	106,000
Mars Hill College, Mars Hill, N. C.	1856	Hoyt Blackwell	734	734	40	125,000	15,000	Mount Holyoke Coll., So. Hadley, Mass.	1837	Sister Maria Corona	266	266	37	578,975	14,160
Martin Luther Coll., New Ulm, Minn.	1884	Carl L. Schewe	173	734	40	20,000	8,500	Mount St. Jos-on-the-Olio, Coll. of, Cin., O.	1890	George J. Rehling	224	224	12	—	22,885
Mary Baldwin College, Staunton, Va.	1842	L. Wilson Jarman	317	332	30	520,561	23,500	Mount St. Mary Sem. of West, Norwood, Ohio	1880	John L. Sheridan	337	337	20	102,000	40,000
Marygrove College, Detroit, Mich.	1910	Sister M. Honora	562	562	68	—	23,500	Mount St. Mary's Coll., Emmitsburg, Md.	1888	Sister M. Doloresa	280	307	34	205,615	25,615
Mary Hardin-Baylor College, Belton, Tex.	1845	Gordon G. Singleton	527	679	47	551,594	23,500	Mount St. Mary's Coll., Los Angeles, Calif.	1935	Sister M. Lucy Dooley	337	337	20	1,000,413	55,000
Maryland Coll. for Women, Lutherville, Md.	1853	Wm. H. Moore, III	170	170	16	—	23,500	Mount St. Mary's Coll., Los Angeles, Calif.	1935	Sister M. Lucy Dooley	337	337	20	215,000	25,701
Maryland State Teachers College, Bowie, Maryland	1908	Leonidas S. James	131	131	15	—	8,087	Mount Union College, Alliance, Ohio	1910	Sister Catherine Marie	280	307	34	—	19,000
Maryhurst Normal School, College Park, Md.	1867	H. C. Byrd	4,060	4,776	867	2,080,000	340,000	Muhlenberg College, Allentown, Pa.	1816	Charles B. Ketcham	451	530	45	205,615	25,615
Marymount College, Salina, Kan.	1911	Mother M. F. Xavier	65	68	12	—	7,000	Mundelein College, Chicago, Ill.	1867	Lewing Tyson	512	601	43	1,405,453	110,000
Marymount College, Taylorsville, N. Y.	1907	Mother Rose Waller	157	185	25	800,000	23,000	Murray State Teachers Coll., Murray, Ky.	1909	Sister M. Justitia	528	528	36	1,000,413	55,000
Maryville College, Maryville, Tenn.	1872	Ralph W. Lloyd	704	707	52	1,744,035	45,600	Muskingum College, New Concord, Ohio	1837	James H. Richmond	888	1,111	77	1,147,200	36,100
Mary Washington Coll., Fredericksburg, Va.	1908	Mother M. Mouton	150	161	30	139,000	10,000	Nassau College, Springfield, Me.	1932	Dawn N. Wallace	173	173	16	20,000	6,000
Marywood College, Scranton, Pa.	1915	Morgan L. Combs	1,213	1,838	142	600,000	26,127	National College of Education, Wash., D. C.	1886	Edna Dean Baker	305	305	16	47,837	18,367
Mass. Inst. of Tech., Cambridge, Mass.	1861	Karl T. Compton	470	710	600	36,220,073	340,000	National University, Washington, D. C.	1869	Leslie G. Garnett	1,186	1,186	66	—	26,187
Mass. State Coll., Amherst, Mass.	1863	Hugh P. Baker	1,050	1,015	142	155,000	18,706	Nazareth College, Nazareth, N. Y.	1924	Robert L. Elliott	189	189	20	50,000	4,000
Mass. State Tch. Coll., Bridgewater, Mass.	1840	John J. Kelly	1,482	1,482	41	15,000	18,706	Neb. State Teachers Coll., Kearney, Neb.	1911	C. S. Boucher	891	891	53	954,654	342,000
Mass. State Tch. Coll., Fitchburg, Mass.	1895	Charles M. Herlihy	309	333	41	—	13,500	Neb. State Teachers Coll., Kearney, Neb.	1911	Robert L. Elliott	1,243	1,243	393	960,913	29,975
Mass. State Tch. Coll., Framingham, Mass.	1899	Herbert H. Howes	406	466	34	—	13,500	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Mass. State Tch. Coll., Lowell, Mass.	1897	James Dugan	148	148	21	—	13,500	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Mass. State Tch. Coll., Salem, Mass.	1897	Edward A. Sullivan	284	287	15	—	13,500	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Mass. State Tch. Coll., Worcester, Mass.	1854	Edward A. Sullivan	501	501	40	—	13,500	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Mass. Tr. Sch. for Tech. & Mech. Arts, Boston	1874	Wm. B. Aspinwall	188	188	22	—	13,500	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Mercer University, Macon, Ga.	1833	Spright Dowell	24	24	72	1,824,863	60,000	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Mercyhurst College, Erie, Pa.	1926	Mother M. Borgia	530	875	31	1,680,000	24,350	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Meredith College, Raleigh, N. C.	1891	Carlisle Campbell	202	333	37	531,162	14,350	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Miami Univ. of, Oxford, Ohio	1825	Bowman Foster Ashe	1,540	1,540	83	—	31,000	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Miami Univ. of, Oxford, Ohio	1825	A. H. Upham	3,201	3,233	225	—	31,000	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Michigan College of Mngt. & Tech., Houghton, Mich.	1860	Grover C. Dillman	870	870	85	—	31,000	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Michigan State Coll., E. Lansing, Mich.	1855	Robert S. Shaw	6,643	6,643	430	—	31,000	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Michigan State Normal Coll., Ypsilanti, Mich.	1819	John M. Munson	1,019	1,019	181	—	60,831	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070
Michigan, University of, Ann Arbor, Mich.	1817	Alexander G. Ruthven	12,434	10,591	773	14,356,133	1,060,784	Neb. Wesleyan Univ., Lincoln, Neb.	1886	John F. Schwartz	430	532	45	304,738	61,070

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Libraries Volumes	Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Libraries Volumes
New Mex. Mil. Inst., Roswell, N. M.	1893	Daniel C. Pearson	504	594	50	\$	16,000	Oregon State College, Corvallis, Ore.	1868	George W. Peavy	4,530	4,617	331	\$	167,451
New Mex. Sch. of Mines, Socorro, N. M.	1889	C. E. Needham	163	135	73	—	5,050	Oregon, University of, Eugene, Ore.	1872	Donald M. Erb	3,700	4,617	331	—	200,318
N. M. Col. Agri. & Mech., Arts, St. Col., N. M.	1889	Hugh M. Milston II	1,286	1,350	14	255,547	38,483	Osgood Hall Law Sch., Toronto, Ont., Can.	1871	John D. Falconbridge	3,700	4,617	331	497,771	38,000
N. Mex. St. Tech. Col., Silver City, N. M.	1893	Haddon W. James	191	253	40	20,101	21,765	Ottawa University, Ottawa, Ont., Can.	1865	Andrew B. Martin	288	331	27	—	18,575
New Mex. Univ. of Albuquerque, N. M.	1889	James F. Zimmerman	191	253	108	7,417,418	75,742	Ottawa University, Westerville, Ohio	1865	J. Rusklin Howe	411	432	30	1,496,021	28,003
New Rochelle, Col. of, New Rochelle, N. Y.	1904	Mother Thomas Aquinas	745	761	72	—	36,427	Our Lady of Elms, Col. of, Chicago, Mass.	1886	James Richard Grant	501	500	34	550,000	17,000
N. Y. Col. of the City of, N. Y., N. Y.	1817	F. B. Robinson	8,042	31,545	970	—	215,000	Our Lady of the Lake Col., San Ant., Tex.	1928	Thomas M. O'Leary	135	135	16	—	15,000
N. Y. St. Col. of Forestry, Syracuse, N. Y.	1911	Samuel N. Spring	500	550	45	—	13,000	Ozarks, The Col. of, Clarksville, Ark.	1891	H. A. Constantineau	386	1,052	33	207,701	40,856
N. Y. St. Col. for Tech., Albany, N. Y.	1841	John M. Sayles	1,260	3,250	94	—	17,082	P						425,050	18,700
N. Y. St. Normal Sch., Brockport, N. Y.	1867	E. C. Hartwell	332	332	28	—	26,000	Pacific College, Newberg, Ore.	1891	Levi T. Pennington	95	110	14	—	10,200
N. Y. State Normal Sch., Cortland, N. Y.	1866	Leslie R. DeGroat	678	678	58	—	27,538	Pacific, College of, the Stockton, Calif.	1881	Tully C. Knolls	148	473	35	270,000	36,118
N. Y. State Normal Sch., Genesee, N. Y.	1866	James B. Welles	478	478	52	—	20,435	Pacific Union College, Angwin, Calif.	1899	Walter I. Smith	233	573	38	509,072	36,118
N. Y. State Normal School, Oswego, N. Y.	1869	Charles W. Hunt	506	506	46	—	20,435	Pacific University, Forest Grove, Ore.	1899	John F. Dobbs	333	342	31	100,000	28,000
N. Y. State Normal School, Potsdam, N. Y.	1861	Ralph W. Sweetman	517	517	35	—	10,000	Paine College, Augusta, Ga.	1883	Edmund C. Peters	336	383	24	34,067	28,006
N. Y. State Normal School, Utica, N. Y.	1866	Clarence O. Lehman	501	501	50	—	10,000	Park College, Parkville, Mo.	1875	William L. Young	500	509	45	1,730,000	20,064
N. Y. State Tech. Col., Buffalo, N. Y.	1886	L. H. van den Berg	466	466	48	—	18,500	Parsons College, Fairfield, Iowa	1875	Donald L. Hibbard	320	415	28	—	22,000
N. Y. State Tech. Col., Buffalo, N. Y.	1886	L. H. van den Berg	466	466	48	—	18,500	Passaic College, Passaic, N. J.	1910	Edwin Wiley	380	406	25	—	12,000
New York University, New York, N. Y.	1811	Harry W. Rockwell	1,000	1,000	80	8,653,870	571,203	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Niagara University, Niagara Univ., N. Y.	1864	Joseph M. Noonan	1,205	1,205	101	—	33,805	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. C. Col. of, Greensboro, N. C.	1891	Ferdinand D. Bluford	827	827	65	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. C. State College, Raleigh, N. C.	1889	J. W. Harrelson	2,295	2,295	225	125,000	51,160	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
North Central College, Naperville, Ill.	1861	Edward E. Rall	600	600	48	—	23,410	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. D. Agri. Col., Fargo, N. D.	1889	Frank L. Eversall	1,721	1,721	135	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. D. Sch. of Forestry, Bottineau, N. D.	1897	Albert F. Annason	150	150	23	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. D. St. Nor. & Ind. Sch., Ellendale, N. D.	1893	John C. McMillan	652	652	23	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. D. St. Sch. of Sci., Wahpeton, N. D.	1893	E. F. Riley	652	652	23	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. D. St. Sch. Col., Dickinson, N. D.	1893	Clas. E. Scott	554	554	28	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. D. St. Sch. Col., Mayville, N. D.	1889	Cyril W. Grace	658	658	25	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. D. St. Sch. Col., Minot, N. D.	1889	C. C. Swain	862	862	52	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. E. St. Sch. Col., Kirkville, Mo.	1883	John H. Ryle	2,168	2,168	61	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
N. E. St. Sch. Col., Kirkville, Mo.	1883	John H. Ryle	2,168	2,168	61	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Northeastern Univ., Boston, Mass.	1863	Frank P. Speare	2,427	2,427	153	1,700,000	120,000	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Northeastern Univ., Boston, Mass.	1863	Frank P. Speare	2,427	2,427	153	1,700,000	120,000	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
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Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
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Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703	—	16,800	Pepperdine College, Pasadena, Calif.	1893	Herbert L. Spencer	301	320	37	557,072	21,210
Nor. St. State Tech. Col., DeKalb, Ill.	1891	Karl Langdon Adams	1,164	1,164	703										

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Library Volumes
Ripon College, Ripon, Wis.	1851	Silas Evans	415	500	34	\$ 938,809	34,825
River Falls St. Col., River Falls, Wis.	1874	J. H. Ames	752	382	43	—	22,200
Roanoke College, Salem, Va.	1842	Charles J. Smith	332	382	28	662,447	20,500
Rochester University of Rochester, N. Y.	1829	Alan Ashby	2,317	3,200	519	\$2,279,013	345,522
Rockford College, Rockford, Ill.	1837	Mary Ashby Cheek	303	304	50	1,099,800	27,371
Rockhurst College, Kansas City, Mo.	1910	Daniel H. Conway	237	1,074	38	882,857	32,000
Rosary College, River Forest, Ill.	1912	Sister Mary Evelyn	506	555	65	108,801	40,385
Rosemont College, Rosemont, Pa.	1924	Donald M. Clephas	262	270	42	1,259,000	25,000
Rose Polytechnic Inst., Terre Haute, Ind.	1874	Thomas B. Prender	667	688	73	1,068,435	22,534
Russell Sage College, Troy, N. Y.	1916	James L. Meador	221	546	22	39,000	14,000
Rust College, Holly Springs, Miss.	1866	Lee M. McCoy	3,509	6,406	576	\$1,176,205	291,568
Rutgers University, New Brunswick, N. J.	1766	Robt. C. Clothier	—	—	—	—	—
Sacred Heart, Conv. of the Cinci., Ohio	1869	Mother C. Warren	90	90	15	—	8,250
Sacred Heart College, Louisville, Ky.	1864	Sister M. Dominica	85	85	26	—	11,609
Sacred Heart College, Davenport, Iowa	1882	C. H. Meinberg	483	1,012	45	600,000	15,000
St. Andrew's College, Saskatoon, Sask., Can.	1912	David S. Dix	53	150	18	5,223	10,000
St. Ann's College, Church Point, N. S., Can.	1889	Jules Comeau	150	300	29	—	12,000
St. Anselm's College, Manchester, N. H.	1857	Bertrand C. Dolan	300	314	38	1,731,830	26,000
St. Benedict's College, Atchison, Kan.	1913	Martin Veth	273	273	41	8,000	38,000
St. Bonaventure College, St. Bonnyville, N. Y.	1939	Mother Rosamond	435	975	64	3,555,750	43,360
St. Catherine College, St. Paul, Minn.	1859	Thomas Plasmann	642	905	63	—	56,000
St. Cloud St. Tech. Col., St. Cloud, Minn.	1867	Sister Eucharista	1,760	1,760	75	—	40,945
St. Edward's University, Austin, Texas	1878	George A. Selke	225	225	33	—	22,500
St. Elizabeth College, Convent Sta., N. J.	1899	Patrick J. Haggerty	423	750	45	—	24,000
St. Francis College, Brooklyn, N. Y.	1858	Rev. Brother Columba	256	256	26	—	10,557
St. Francis College, Burlington, Wis.	1919	Rev. Brother Columba	35	35	5	1,100,000	5,000
St. Francis College, Loretto, Pa.	1845	Edw. P. M. Caraher	258	261	26	—	14,000
St. Francis College, Joliet, Ill.	1874	Sister M. Amiccia	122	123	28	14,000	33,443
St. John's College, Annapolis, Md.	1796	Stringfellow Barr	106	209	14	22,500	10,000
St. John's Lutheran Col., Winfield, Kan.	1893	Carl S. Munding	6,556	6,556	303	—	57,000
St. John's University, Brooklyn, N. Y.	1870	Edward J. Walsh	643	652	75	30,000	63,142
St. John's University, Collegeville, Minn.	1857	Alcun Deutsch	183	184	39	—	13,178
St. Joseph's College, Philadelphia, Pa.	1869	Sister Paula Dunn	520	520	36	—	15,000
St. Joseph's College, Princeton, N. J.	1851	A. de C. Hamilton	100	100	15	—	17,000
St. Joseph's College, West Hartford, Conn.	1882	Thomas E. Molloy	280	452	41	—	9,500
St. Joseph's Col. for Women, Brooklyn, N. Y.	1916	Joseph E. McCarthy	72	142	11	2,267,133	94,840
St. Joseph's Col. for Women, Portland, Me.	1915	Laurens H. Seelye	1,439	1,714	87	\$1,800,000	157,719
St. Lawrence University, Canton, N. Y.	1856	H. B. Crimmins	4,125	4,704	36	530,675	17,511
St. Louis University, St. Louis, Mo.	1818	Arthur M. Murphy	219	125	12	—	70,000
St. Mary College, Leavenworth, Kan.	1923	Sister M. Bernard	277	277	32	—	6,000
St. Mary of the Lake Sem., Mundelein, Ill.	1921	Reynold Hillenbrand	176	366	28	—	21,068
St. Mary of the Springs Col., Columbus, O.	1911	Sister M. Aloyse	93	101	19	1,062,344	21,688
St. Mary-of-the-Woods Col., Indiana	1916	Sister Mary Agnes	263	263	40	750,000	11,880
St. Mary's College, Halifax, N. S., Canada	1840	Mother Mary Bernard	165	195	16	610,300	60,021
St. Mary's Col., Notre Dame, Holy Cross, Ind.	1841	Michael J. Lannon	301	448	57	100,000	31,758
St. Mary's College, St. Mary, Ky.	1844	Sister Mary Madeleva	85	85	8	—	33,000
St. Mary's College, St. Mary's, Calif.	1821	A. A. Eicheldinger	530	530	43	185,000	35,000
St. Mary's College, St. Mary's, Kan.	1848	Brother Albert	106	106	26	—	30,000
St. Mary's College, Winona, Minn.	1912	Adam C. Ellis	338	328	32	—	18,653
St. Mary's Sem. & Univ., Baltimore, Md.	1791	John F. Fenlon	423	423	32	—	39,000
St. Michael's College, Toronto, Ont., Can.	1852	Walter F. Goltka	305	767	37	12,500	26,000
St. Michael's College, West De Pere, Wis.	1904	E. J. McCorkell	850	850	60	111,000	14,000
St. Norbert College, Winona, Minn.	1868	Leon E. Gosselin	225	225	25	—	20,010
St. Olaf College, Northfield, Minn.	1874	Bernard H. Pennings	344	773	37	975,238	45,000
St. Paul Norm. & Ind. Sch., Lawrenceville, Va.	1888	L. W. Boe	1,111	1,124	78	145,307	11,144
St. Peter's College, Jersey City, N. J.	1882	J. Alvin Russell	868	868	60	—	15,000
St. Procopius College, Lisle, Ill.	1870	Dennis J. Conzel	424	424	43	53,000	30,000
St. Rose College, Albany, N. Y.	1910	Procopius Neuzil	127	127	24	793,500	8,600
St. Rose College, of Winona, Minn.	1911	Edmund Gibbons	346	360	37	—	39,111
St. Thomas College, St. Paul, Minn.	1885	Sister M. A. Molloy	466	770	51	706,344	31,516
St. Vincent College, Latrobe, Pa.	1846	James H. Moynihan	820	820	52	2,516,330	47,512
Salem College, Salem, N. C.	1888	Alfred Koch	431	547	52	446,023	100,000
Salem College, Winston-Salem, N. C.	1888	S. Orestes Bond	240	490	24	—	17,000
San Francisco Col. for Women, San Francisco, Cal.	1860	H. E. Rondthaler	318	332	43	159,135	34,000
San Francisco Col. for Women, San Francisco, Cal.	1930	W. W. Jackson	263	400	31	—	8,073
San Jose State College, San Jose, Calif.	1855	Mother Leonard Mejia	107	268	30	—	43,000
San Jose State College, San Jose, Calif.	1855	William J. Dunne	720	900	77	—	75,000
San Jose State College, San Jose, Calif.	1855	T. W. MacQuarrie	4,003	4,419	106	—	—
Santa Barbara St. Col., Santa Barbara, Calif.	1909	Clarence L. Phelps	1,487	1,594	120	—	37,000
Santa Clara, Univ. of, Santa Clara, Calif.	1777	Louis C. Rudolph	511	511	51	—	62,000
Sarah Lawrence College, Bronxville, N. Y.	1926	Constance Warren	885	287	55	444,735	33,000
Saskatchewan Univ., Saskatoon, Sask., Can.	1907	James J. Thomson	1,848	3734	126	103,320	69,000
Scripps College, Claremont, Calif.	1926	Ernest S. Jaques	220	220	31	770,205	20,000
Seattle Pacific College, Seattle, Wash.	1891	Chas. Hoyt Watson	334	355	30	86,000	12,500
Seton Hall College, South Orange, N. J.	1856	James F. Kelley	581	1,763	125	86,992	17,000
Shaw Hall College, Greensburg, Pa.	1805	James A. Reeves	404	702	55	500,000	22,900
Shaw University, Raleigh, N. C.	1815	Robert P. Daniel	408	427	29	397,000	15,000
Shenandoah College, Shepherdstown, W. Va.	1875	Wade S. Miller	149	165	20	45,000	6,325
Shurtleff College, Rome, Ga.	1872	W. H. S. White	300	318	21	85,000	15,840
Simmons University, Boston, Mass.	1873	Paul M. Cousins	210	220	27	406,000	16,000
Simmons University, Louisville, Ky.	1899	Bancroft Beatty	337	337	21	357,743	86,266
Simmons College, Indianapolis, Ind.	1873	M. B. Lanier	91	162	16	3,630,612	86,266
Sioux Falls College, Sioux Falls, S. D.	1883	John Owen Gross	508	643	36	1,404,958	30,000
Sioux Falls College, Sioux Falls, S. D.	1883	W. P. Behan	245	338	25	281,000	14,000
Sisters College of Cleveland, Cleveland, O.	1911	Jos. Schrems	128	492	31	—	—
Skidmore College, Saratoga Springs, N. Y.	1928	Henry T. Moore	791	796	80	893,669	54,066
Smith College, Northampton, Mass.	1871	Elizabeth Cutter	2,077	2,077	238	6,129,902	266,964
Snow College, Ephraim, Utah	1888	James A. Nuttall	269	212	21	—	8,200
Snow College, Utah	1888	C. W. Pugsley	1,470	2,275	201	557,621	63,000
So. Dak. St. Sch. of Mines, Rapid City, S. D.	1883	Joseph P. Connelly	398	400	34	—	10,000
So. Dak. St. Sch. of Mines, Rapid City, S. D.	1883	I. D. Weeks	900	1,000	100	—	100,000
S. E. Mo. St. Tech. Col., Cape Girardeau, Mo.	1873	Walter W. Parker	1,277	1,320	55	—	70,000
Southeastern State College, Durant, Okla.	1909	T. T. Montgomery	1,132	1,132	61	—	20,500
Southeastern University, Washington, D. C.	1864	James A. Bell	1,520	1,432	65	1,600,000	6,500
So. Calif., Univ. of, Los Angeles, Calif.	1879	R. B. von KleinSmid	4,876	15,207	636	—	240,000
Southern Illinois Normal University, Carbondale, Ill.	1874	Roscoe Pulliam	1,081	2,480	154	—	43,252
Southern Methodist Univ., Dallas, Texas	1911	Umphrey Lee	1,800	3,800	164	2,324,834	126,800
Southern Oregon College of Education, Ashland, Ore.	1926	Walter Redford	269	278	28	—	14,877
Southern St. Norm. Sch., Springfield, S. D.	1881	Wm. A. Thompson	269	295	21	116,000	12,000
So. Univ. & Art. & Mech. Col., Scotland, Pa.	1874	F. G. Clark	1,557	1,908	99	—	16,000
South University of the Seawane, Tenn.	1857	Alexander Guerry	358	368	20	1,556,399	59,281
S. W. Tex. St. Tech. Col., San Marcos, Tex.	1899	C. E. Evans	1,241	1,364	62	—	44,000
Southwestern College, Memphis, Tenn.	1875	Charles E. Diehl	472	518	33	454,900	45,000
Southwestern College, Winfield, Kan.	1885	Frank B. Mossman	282	580	50	600,184	24,000
S. W. Col. Div. of, Weatherford, Okla.	1903	James B. Boren	929	1,260	50	—	39,657
Southwestern Univ., Georgetown, Texas	1840	Luther E. Frazar	2,278	2,403	93	600,000	47,000
Spearfish Normal School, Spearfish, S. D.	1883	E. C. Woodburn	417	403	33	—	18,802
Spring Hill College, Spring Hill, Ala.	1830	Wm. D. O'Leary	350	363	30	3,127,335	62,000
Stanford Univ., Stanford University, Calif.	1885	Ray L. Wilbur	4,302	4,302	33	30,521,887	749,000
Stanstead Wesleyan Col., Stanstead, Que., Can.	1872	Errol C. Amaron	325	325	33	150,000	3,000
State Normal School, Columbia, Mo.	1861	James M. Wood	350	350	31	—	1,200
Stephens College, Columbia, Mo.	1833	Hugh A. Kelsey	317	350	26	128,015	32,500
Stevens College, Sterling, Kan.	1887	Harvey N. Davis	605	970	72	460,230	15,000
Stevens Inst. of Tech., Hoboken, N. J.	1870	Henry T. McDonald	155	170	14	125,000	30,000
Storer College, Harpers Ferry, W. Va.	1867	Burton E. Nelson	653	653	45	—	20,677
Stout Institute, The Monmouth, Wis.	1893	Kenneth C. East	205	205	17	—	8,500
Su. Bennet College, London, Ky.	1896	Wm. E. Martin	380	420	40	100,000	7,400
Sull Ross State Tech. Col., Alpine, Tex.	1917	Horace W. Morelock	328	328	35	493,320	15,400
Swarthmore College, Swarthmore, Pa.	1868	G. Morris Smith	713	731	113	780,000	125,000
Swarthmore College, Swarthmore, Pa.	1868	Frank Aydelotte	455	455	52	444,192	24,500
Sweet Briar College, Sweet Briar, Va.	1904	Meta Glass	6,411	10,415	673	4,700,432	260,801
Syracuse University, Syracuse, N. Y.	1870	Wm. Pratt Graham	269	271	30	1,116,107	18,593
Talladega College, Talladega, Ala.	1867	Buell G. Gallagher	100	212	21	610,101	16,327
Taylor College, Taylor, Mo.	1884	Robt. Lee Stuart	340	340	24	393,498	14,500
Taylor University, Taylor, Ind.	1826	Carl J. Ryan	585	585	24	219,591	21,951
Tch. Col., Athens of O., Cincinnati, O.	1838	Charles E. Beury	5,188	10,451	776	107,621	170,521
Temple University, Philadelphia, Pa.	1884	J. M. Hale	1,800	1,800	85	—	20,000
Tenn. Agri. & Indus. St. Tech. Col., Nashville	1892	Chas. C. Sherrod	1,713	1,435	50	—	30,535
Tennessee Poly. Inst., Cookeville, Tenn.	1915	Richard C. Jones	1,713	1,435	50	—	30,535
Tenn. State Tech. Col., Johnson City, Tenn.	1909	Q. M. Smith	217	217	55	—	25,000
Tennessee State Tech. Col., Memphis, Tenn.	1917	J. M. Smith	747	747	55	—	25,000
Tenn. State Tech. Col., Murfreesboro, Tenn.	1917	James D. Hoskins	5,050	5,050	368	468,000	102,816
Tennessee Univ. of Knoxville, Tenn.	1794	Thomas O. Walton	5,050	5,050	368	200,000	67,500
Tex. Agri. & Mech. Col. of Col. Station	1871	Edward M. Walts	1,342	2,042	75	4,610,722	46,975
Texas Christian Univ., Fort Worth, Tex.	1873	—	—	—	—	—	—

Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Library Volumes	Institution and Location	Year Founded	Chief Executive	Full Time Students	Part Time Students	Faculty	Endowment	Library Volumes
Texas College, Tyler, Texas	1891	D. R. Glass	523	395	36	\$	8,250	Washington, University of, Seattle, Wash.	1861	Lee Paul Steg	10,662	—	493	\$ 5,021,381	441,931
Texas Col. of Arts and Industries, Kingsville, Tex.	1917	J. O. Loftin	994	1,242	65	—	20,854	Wayland College, Plainview, Texas	1909	George W. McDonald	185	225	11	15,000	5,000
Texas Col. of Mines and Metall., El Paso, Tex.	1913	Dossie M. Wiggins	1,019	1,014	50	1,000,000	27,000	Wayne University, Detroit, Mich.	1933	Frank Cady	5,777	11,821	400	—	11,601
Texas St. Col. for Women, Denton, Tex.	1901	Louis H. Hubbard	2,847	3,950	107	—	74,000	Weatherford College, Weatherford, Pa.	1889	Frank R. Stewart	448	—	22	192,018	13,000
Texas Technological Col., Lubbock, Tex.	1925	Clifford B. Jones	3,800	3,960	174	—	65,032	Weatherford College, Weatherford, Texas	1889	G. C. Boswell	483	302	20	78,000	6,352
Texas University of Austin, Tex.	1881	Homier Price Rainey	9,872	19,352	501	32,875,495	613,615	Weber College, Ogden, Utah	1899	H. A. Dixon	800	875	30	—	10,000
Texas Wesleyan College, Fort Worth, Tex.	1890	Law Sone	524	571	501	147,481	17,741	Weber College, Webster Groves, Mo.	1915	George F. Donovan	157	221	201	8,972,218	186,000
Tillotson College, Austin, Texas	1872	Mary E. Branch	392	700	24	—	61,000	Wellesley College, Wellesley, Mass.	1869	Mildred H. McNece	1,500	1,512	201	1,360,818	83,200
Toledo, University of, Toledo, Ohio	1877	Philip C. Branch	2,231	3,534	145	—	80,000	Wellesley College, Wellesley, Mass.	1869	William E. Weld	307	307	46	8,003,497	241,107
Toronto Bible College, Toronto, Ont., Can.	1894	E. G. Baker	366	380	7	—	368,280	West Chester St. Ch. Col., West Chester, Pa.	1836	J. L. McCaughy	742	215	30	9,000	6,804
Toronto University of, Toronto, Ont., Can.	1827	Henry J. Cady	6,031	7,202	1057	23,000,000	7,000	Western Carolina Tech. Col., Cullowhee, N.C.	1896	Chas. S. Swope	1,580	1,618	80	—	30,000
Tougaloo College, Tougaloo, Miss.	1869	Judson L. Cross	144	144	10	45,412	11,990	Western College, Oxford, Ohio	1853	Hiram T. Hunter	302	302	41	910,621	15,500
Transylvania College, Lexington, Ky.	1780	Raymond F. McLaughlin	440	450	31	693,886	39,881	Western Ky. St. Ch. Col., Macon, Ill.	1899	Ralph K. Hickok	1,070	—	88	—	48,200
Trinity College, Hartford, Conn.	1825	Sister M. Emmanuel	60	80	14	—	12,000	Western Maryland Col., Westminster, Md.	1896	Paul L. Garrett	1,591	1,081	107	—	33,088
Trinity College, Sioux City, Ia.	1912	Remsen B. Ogilby	549	563	33	3,510,705	9,995	Western Maryland Col., Westminster, Md.	1896	Frederic G. Holloway	594	807	56	907,022	31,138
Trinity University, Washington, D.C.	1869	Joseph V. Trunk	74	282	25	1,500,000	38,000	Western Reserve Univ., Cleveland, Ohio	1836	Winifred G. Leutner	3,297	11,610	749	1,413,114	510,000
Trinity State College, Angola, Ind.	1884	F. L. Wear	370	415	31	707,400	17,201	West St. Ch. Col., Gummison, Colo.	1911	Chas. C. Casey	702	772	30	—	17,125
Tufts College, Medford, Mass.	1852	Burton Handy	1,000	1,000	38	7,839,594	190,000	West St. Ch. Col., Kalamazoo, Mich.	1904	Paul V. Sangren	2,788	4,014	210	—	18,011
Tulane University, New Orleans, La.	1834	Leonard Carmichael	2,061	2,134	500	10,664,417	239,094	West St. Ch. Col., Kalamazoo, Mich.	1904	David O. Kime	280	420	23	180,000	13,000
Tulsa, University of, Tulsa, Okla.	1894	Rufus C. Harris	826	1,501	80	1,254,666	51,909	Westfield State Teachers College, Westfield, Mass.	1830	Edward J. Scanlon	123	124	26	—	13,500
Tuskegee Inst., Tuskegee Institute, Ala.	1881	F. D. Patterson	1,282	2,110	178	6,091,908	45,429	West Liberty St. Ch. Col., W. Liberty, W. Va.	1838	Paul N. Elbin	308	584	24	—	17,526
Union College, Barboursville, Ky.	1870	Conway Boatman	267	287	21	373,000	13,180	Westminster College, Fulton, Mo.	1853	R. F. McCluer	305	305	23	915,000	28,615
Union College, Lincoln, Neb.	1801	A. H. Rulkoetter	382	418	35	—	20,000	Westminster College, Fulton, Mo.	1853	R. F. McCluer	305	305	23	915,000	28,615
Union College, Schenectady, N. Y.	1795	Dixon Ryan Fox	823	823	30	4,425,303	29,000	Westminster College, Salt Lake City, Utah	1875	R. F. McCluer	305	305	23	915,000	28,615
Union University, Jackson, Tenn.	1834	John J. Hurt	400	407	30	277,350	15,000	Westminster College, Tehuacana, Texas	1805	Clarence A. Sutton	1,135	1,140	21	25,000	6,000
U.S. Coast Guard Acad., New London, Conn.	1876	Edward D. Jones	207	207	30	—	13,000	West Texas St. Ch. Col., Canyon, Tex.	1910	J. A. Hill	1,165	3,085	75	—	27,500
U.S. Military Academy, West Point, N. Y.	1802	Jay L. Benedict	1,812	1,812	281	—	100,000	West Texas St. Ch. Col., Canyon, Tex.	1891	John W. Davis	857	1,543	83	—	42,700
U.S. Naval Academy, Annapolis, Md.	1845	Wilson Brown	2,305	2,305	270	—	88,000	West Virginia State Col., Institute, W. Va.	1896	Charles E. Lawall	3,410	3,215	267	—	101,666
Upper Iowa University, Fayette, Iowa	1857	V. L. Smith	310	312	18	450,000	16,500	Whitman College, Walla Walla, Wash.	1834	John W. Davis	974	974	67	17,700,218	58,140
Ursinus College, East Orange, N. J.	1803	L. A. Lawson	443	628	34	100,000	25,000	Whitman College, Walla Walla, Wash.	1834	James O. Buswell, Jr.	1,088	1,368	71	680,799	59,026
Ursuline College, Cleveland, Ohio	1869	Norman E. McClure	566	566	45	618,962	30,000	Whittier College, Whittier, Calif.	1891	W. O. Mendenhall	528	528	46	1,108,610	68,838
Ursuline College, Cleveland, Ohio	1869	Mother M. C. Greene	199	199	32	—	16,000	Whittier College, Whittier, Calif.	1891	F. T. Hardwick	205	237	26	40,302	14,000
Utah State Agr. Col., Logan, Utah	1912	Mother Mary Bernard	146	150	22	—	14,150	Wichita, Municipal Univ. of, Wichita, Kan.	1926	William M. Jardine	1,508	1,658	103	197,778	52,313
Utah, University of, Salt Lake City, Utah	1888	Elmer G. Peterson	2,947	3,220	435	707,794	142,554	Wiley College, Marshall, Texas	1873	Matthew W. Dorgan	612	1,067	40	612,000	16,201
Valparaiso University, Valparaiso, Ind.	1873	W. G. Friedrich	558	578	42	548,633	38,700	Williamette University, Salem, Ore.	1842	Bruce R. Baxter	831	831	58	1,720,000	42,000
Vanderbilt University, Nashville, Tenn.	1872	Oliver C. Carmichael	1,867	1,807	45	23,213,972	217,905	William and Mary Col., Williamsburg, Va.	1693	John Stewart Bryan	1,300	1,300	92	1,500,000	110,000
Vassar College, Poughkeepsie, N. Y.	1861	Henry N. MacCracken	1,225	1,235	216	9,739,000	218,263	Williams College, Williamstown, Mass.	1826	John F. Herget	438	438	26	1,100,591	15,125
Vermont State Norm. Sch., Castleton, Vt.	1867	Caroline S. Woodruff	165	176	11	—	7,200	Williams College, Williamstown, Mass.	1826	James P. Baxter	830	830	97	1,036,000	171,101
Vermont St. Norm. Sch., Johnson Center, Vt.	1867	D. W. McClelland	96	96	11	—	5,808	William Woods College, Fulton, Mo.	1893	Henry G. Harmon	296	323	32	680,000	10,750
Vermont St. Norm. Sch., Lyndon Center, Vt.	1921	Rita L. Hole	125	125	11	—	5,808	Williamette College, Salem, Ore.	1842	John Stewart Bryan	1,300	1,300	92	1,500,000	110,000
Victoria College, Victoria, B. C., Can.	1902	Guy W. Bailey	2,320	2,320	216	3,558,463	159,230	Wilmington College, Wilmington, Ohio	1880	George H. Schuler	161	275	42	—	20,000
Villanova College, Villanova, Pa.	1862	Percy H. Elliott	204	248	12	—	7,500	Wilmington College, Wilmington, Ohio	1880	Walter L. Collins	300	412	25	325,000	16,100
Villanova University, Villanova, Pa.	1862	E. W. Wallace	911	1,038	45	3,018,597	99,110	Winona State Teachers Col., Winona, Minn.	1860	Paul Swain Havens	383	383	50	810,814	12,000
Vincennes University, Vincennes, Ind.	1856	E. W. Stanford	927	2,000	431	—	50,000	Winthrop College, Rock Hill, S. C.	1886	O. Myking Mehus	513	513	45	—	12,000
Virginia Intermont College, Bristol, Va.	1884	W. A. Davis	120	125	10	15,000	7,576	Wisconsin State Tech. Col., Eau Claire, Wis.	1916	Harvey A. Schofield	1,701	1,721	38	—	6,301
Virginia Military Inst., Lexington, Va.	1820	Hugh G. Noffsinger	390	450	31	220,616	7,719	Wisconsin State Tech. Col., Eau Claire, Wis.	1916	Harvey A. Schofield	1,701	1,721	38	—	6,301
Va. Polytechnic Inst., Lexington, Va.	1839	C. E. Kilbourne	712	712	56	340,312	51,448	Wisconsin State Tech. Col., Oshkosh, Wis.	1880	Forrest R. Polk	1,246	1,246	41	—	26,000
Va. St. Col. for Negroes, Petersburg, Va.	1872	Julian A. Burruss	3,057	3,060	235	173,000	25,647	Wisconsin State Tech. Col., Oshkosh, Wis.	1880	Forrest R. Polk	1,246	1,246	41	—	26,000
Virginia State Tech. Col., Farmville, Va.	1884	John M. Gandy	1,137	1,137	131	—	27,876	Wisconsin State Tech. Col., Oshkosh, Wis.	1880	Forrest R. Polk	1,246	1,246	41	—	26,000
Va. Theol. Sem. & Col., Lynchburg, Va.	1887	Joseph L. Jarman	905	905	131	—	30,000	Wisconsin State Tech. Col., Oshkosh, Wis.	1880	Forrest R. Polk	1,246	1,246	41	—	26,000
Virginia Union University, Richmond, Va.	1865	Wm. H. R. Powell	233	121	52	875,000	33,500	Wisconsin State Tech. Col., Oshkosh, Wis.	1880	Forrest R. Polk	1,246	1,246	41	—	26,000
Virginia, Univ. of, Charlottesville, Va.	1819	John L. Newcomb	2,934	—	269	11,038,877	33,500	Wisconsin State Tech. Col., Oshkosh, Wis.	1880	Forrest R. Polk	1,246	1,246	41	—	26,000
Wabash College, Crawfordsville, Ind.	1832	Louis R. Hopkins	412	415	30	2,107,003	81,615	Wofford College, Spartanburg, S. C.	1845	Reas E. Villages	1,140	1,140	50	1,535,350	62,210
Wake Forest College, Wake Forest, N. C.	1834	C. C. Stoughton	282	292	23	350,000	68,000	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Wallis College, Walla Walla, Wash.	1862	Thurman D. Kitchin	1,016	1,016	60	—	15,000	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Warburton College, Warburton, Wash.	1860	George W. Bowers	606	606	42	—	15,000	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Washington & Jefferson Col., Wash., Pa.	1780	E. J. Brault	459	459	25	700,000	17,577	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Washington College, Lexington, Va.	1789	Ralph C. Hutchison	571	627	42	1,751,235	57,413	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Washington and Lee Univ., Lexington, Va.	1783	Francis P. Mead	935	935	62	3,160,632	105,000	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Washington State Col., Yakima, Wash.	1901	Gilbert W. Mead	313	313	28	—	17,500	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Washington State Col., Pullman, Wash.	1900	Ernest O. Holland	1,078	1,078	41	4,180,378	400,000	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Washington St. Norm. Sch., Machias, Me.	1853	Philip H. Kimball	88	88	16	—	6,000	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000
Washington St. Norm. Sch., Machias, Me.	1853	George R. Throop	3,512	8,127	656	17,710,067	309,019	Woodsstock College, Woodstock, Md.	1881	Henry N. Snyder	455	470	20	605,587	13,000

University Professors, American Association of: *see* ACADEMIC FREEDOM.

Uranium. Closely associated with radium, Canada and Belgian Congo are the chief sources of uranium. In 1937, Canada produced 212,000 lb. of uranium salts from the treatment of 290 short tons of ore. Exports of uranium ore from Belgian Congo are irregular, being none in 1938 and 1,052 metric tons in 1937; the average during the past several years has been about 400 tons; exports of uranium salts from Belgium, where the ore is treated, have been increasing, and reached 150 tons in 1936. The uranium content of ores produced in the United States in 1938 was only 51,705 lb., while imports of uranium oxide and other salts during the year totalled 376,708 pounds. The chief use is as a colouring agent in ceramics and glass, there being little use for the metal itself. (G. A. Ro.)

Urology. Probably the most important recent advance in the field of urology has been in chemotherapy. In no field of medicine has the value of international co-operation been better exemplified than in the development and clinical application of such important chemotherapeutic agents as mandelic acid, the hydrochloride of 2:4-di-amino-azobenzene-4-sulphonamide (prontosil), para-amino benzene sulphonamide (sulphanilamide) and sulphapyridine. This group of drugs has revolutionized the treatment of infections of the genito-urinary tract. Sulphanilamide and sulphapyridine are the most valuable agents yet discovered for the treatment of gonorrhoea. Recent reports would indicate that sulphapyridine is more effective than sulphanilamide in the treatment of this disease. Sulphanilamide and neoprontosil, however, are superior in the treatment of other types of infection in the urinary tract. Sulphanilamide and prontosil have been found to be more efficacious in the treatment of bacillary than coccic infections, but, like mandelic acid, the effectiveness of sulphanilamide and prontosil is reduced in the presence of complicating factors such as stone and hydronephrosis. Mandelic acid is also widely employed in the treatment of uncomplicated bacilluria and is usually attended by less systemic reaction than that which results from the use of sulphanilamide. An appreciation of the toxic manifestations of these drugs makes it imperative that they be administered under the close supervision of a physician. In the selection of these drugs it has been found necessary to pay close attention to bacteriologic factors involved in the infected urine. Additional studies of the normal bacterial flora of the urethra and bladder, together with improved media for the culturing of pathogenic bacteria and detection of urea-splitting organisms, are a definite contribution. During recent years the recognition of gonococcic infection by means of cultures has been generally employed.

Although the fundamental causes of calculous formation in the urinary tract are still unsolved, important pathologic and bacteriologic studies have been reported in recent years which throw some light on causative factors. The importance of infection in some instances of formation of calculi, particularly in the presence of such urea-splitting organisms as the staphylococcus and proteus, would seem to be more clearly established than was formerly the case. Attention has been called to the frequent occurrence of "milk patches" in the renal papillae, which apparently constitute a nucleus for development of calculus. Continued effort to prevent the re-formation of urinary calculi following surgical removal by diet, vitamin A therapy and acidification seems justified, although no definite value has as yet been shown for such treatment as a substitute for surgical intervention.

There has been an increasing degree of appreciation of excretory urography as a diagnostic procedure, with the use of serial, angulated, respiratory and postural urograms.

In the field of surgery, continued and more extensive use of transurethral prostatic resection has emphasized the value of this procedure in the hands of the skilled surgeon. The excellent functional results and the associated low mortality and morbidity rate reported by a skilful few indicate this to be more and more the procedure of choice in the treatment of the enlarged prostate gland. Transurethral resection is also being employed more often than heretofore in removing small amounts of prostatic and sphincter tissue which has been causing urinary retention, this type of retention having been regarded previously as being of neurogenous origin.

The operation of ureterosigmoidostomy, or the transplantation of the ureters into the sigmoidal portion of the colon for the diversion of the urinary stream, has been accepted as the procedure of choice in instances of exstrophy of the bladder, irreparable vesicovaginal fistulas and intractable cystitis, as well as in selected instances of carcinoma of the bladder. Simultaneous transplantation of both ureters, followed by total cystectomy after a period of a few weeks, is now regarded as the best method of relieving patients who have extensive carcinoma of the bladder.

The attention of the urologist has been called to the important association of unilateral renal disease and hypertension by recent experimental observations with ischemia produced by partial compression of the renal arteries. This work has revived the theory which associated hypertension with renal disease. Case reports indicating clinical application of the results of these experiments have appeared in recent medical literature. Nephrectomy for unilateral renal disease caused by chronic infection and for congenital malposition of the kidney with partial occlusion of the renal vein, has been followed by disappearance of hypertension. Attention of the urologist is called to the wisdom of careful investigation of the kidney itself before subjecting the patient to extensive sympathectomy and operations on the adrenal body for malignant hypertension. On the other hand, careful post-operative clinical investigation will be necessary to prove that nephrectomy has been the chief factor in a permanent reduction of the blood pressure of a patient who previously had hypertension.

The use of intravenous anaesthesia for urologic procedures of short duration is a definite contribution, and the continued use of spinal anaesthesia in limited extents has gained the method a permanent place in this field.

Advances in the use of endocrinologic substances in the treatment of various lesions in the genito-urinary tract are still in the experimental stage, although there is definitely increased interest in this field. There has been much closer co-operation between the biochemist and the urologist than has been the case before. Much experimental and some clinical use of the male and female sex hormones has been reported. The use of these hormones in the treatment of prostatic hypertrophy has thus far been disappointing, in spite of a few encouraging reports. Continued use of the anterior-pituitary-like gonad-stimulating substance of the urine of pregnancy in the treatment of undescended testes is useful, although such a procedure is not unattended with dangers. It is probably most useful during or prior to the age of puberty when, even though surgical intervention may be necessary, use of the substance will make the operation easier for the surgeon. The female sex hormone (oestrin) is of value in the treatment of vulvovaginitis in children. (See also CHEMOTHERAPY.)

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Uruguay, a republic on the Atlantic coast of South America, between Brazil and Argentina; language, Spanish; president, General Alfredo Baldomir; area, 72,153 square miles. Population (1933 census): 1,993,234; official estimate (1939), 2,132,888. The percentage of whites in the population is greater than in any American country except Argentina and Canada. The chief cities are: Montevideo, 684,036; Paysandú, 40,000; Salto, 30,000; Mercedes, 23,000; Colonia, 12,000.

History.—Politically, Uruguay was quiet and stable during 1939, with indications of a gradual return to the full exercise of democracy which had characterized the country during the quarter-century preceding 1930. The country was still faced with economic difficulties, but the outbreak of the European war in Sept. 1939 had a generally (although not entirely) favourable effect, due especially to the increased sale of livestock products. To provide subsidies for adversely affected industries, a 25% tax was imposed on war-time profits of the pastoral industry. Meanwhile, wool sales increased, and, in November, the British Government purchased £862,938 value of British beef. Acreage for the 1939-40 season was higher for all crops except wheat and birdseed. In the last months of the year, a reciprocal trade agreement with the United States was in process of negotiation, but observers were pessimistic as to the outcome.

Uruguay participated in the Panama Conference, and was a leader in the expulsion of Russia from the League of Nations in December. On December 13, the German pocket-battleship "Admiral Graf Spee" engaged in battle with three British cruisers off the Uruguayan coast and fled to Montevideo in a crippled condition. German demands for time for repairs were rejected and the "Spee's" internment was ordered unless she departed by December 17. When the vessel left Montevideo, its crew scuttled it in sight of Montevideo. On December 30, the German merchantman "Tacoma," auxiliary to the "Spee," was given 48 hours to leave or be interned, and was interned Jan. 1, 1940.

Education.—Education is free and compulsory. There are nearly 2,000 elementary and secondary schools, with more than 200,000 pupils. The National university at Montevideo, with 10,000 students, ranks high. In 1937, 87.64% of all education was borne by the State. Montevideo is one of South America's leading cultural centres.

Finance.—The monetary unit is the peso, valued at 38 cents U.S. (Dec. 1939). The public debt was 350,171,000 pesos in 1938.

Communications.—External communication is largely by water, with railway, highway and air transport assuming greater importance, however. There are approximately 22,487 mi. of highways of all classes, and 1,650 mi. of railways (of which 90% is under British control and ownership). Regular and frequent communication by air is maintained with Buenos Aires and with Brazil.

Foreign Trade.—Livestock products comprise 85% of all exports. Wool alone totals over 45%. Agricultural products, almost entirely cereals, aggregate 10%. In 1938 imports were 74,394,730 pesos, exports, 96,355,248 pesos. Great Britain held first place in each, with 19.8% and 26.1% respectively; Germany, formerly third, supplanted the United States in second place, increasing her sales to Uruguay by 46%, and her purchases by 73.3%, bringing her share of the imports and exports to 16.8% and 23.5%, respectively. Imports from the United States declined 18%, and aggregated 12% of the total, while United States purchases fell 72.4% to form only 4% of all exports. Imports are chiefly machinery, textiles and clothing, and foodstuffs and beverages. Exports normally exceed imports, but public debt service, dividends and other foreign capital payments usually more than offset. In the first half of 1939, imports and exports were respectively 54,528,000 pesos and 30,055,000 pesos, with the United States rank-

ing sixth in total trade.

Production.—Cattle-breeding and sheep-raising are the chief industries, and nearly 80% of the land is devoted to grazing. Processing and packing of meat products is an important industry. Wheat, linseed, maize, oats, potatoes are the chief agricultural products. (See HISPANIC AMERICA AND THE EUROPEAN WAR.)

(L. W. BE.)

U.S.S.R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Utah, a Rocky Mountain State, admitted to the United States in 1896, is popularly known as the "Mormon State"; area, 84,990 sq. mi.; population in 1930, 507,847; in 1939, 520,000 (estimated). In 1930 there were 495,955 native whites, 1,108 Negroes, and 10,784 persons of other races, including 4,012 Mexicans, 3,269 Japanese, and 158 Filipinos. Salt Lake City, the capital, had a population of 140,267 in 1930 and 149,000 (estimated) in 1939. Other cities: Ogden, railway centre (1930), 40,272; Provo, seat of Brigham Young university (1930), 14,766; Logan, 10,061.

History.—Mormon population of the capital is estimated at 40% and that of the rural districts at 60%. In recent years the Mormon social security program has attracted national interest.

With 21 Democrats and 2 Republicans in the Senate, and 45 Democrats and 15 Republicans in the House, the legislature followed a conservative course, rejecting homestead tax exemption and revamping old-age pension laws so that aid will be based upon age and need rather than age alone. An act to exempt personal property from taxation up to \$300 was passed, but legislation in the direction of trade barriers, including a chain store tax proposal, was defeated.

Efforts to prohibit married women from receiving public employment resulted only in the adoption of a resolution urging State agencies to spread work as much as possible. Other laws provided for a Fair Trade Practices Act for agriculture by which farmers hope to stabilize farm products prices, the relief of business from the average monthly inventory tax by substituting a year-end inventory tax, the control of small-loan agencies by the State banking department, and extension of the eight-hour day for women to all occupations. Governor: Henry H. Blood.

E. E. Monson was secretary of State; John W. Guy, auditor; Reese M. Reese, treasurer; Joseph Chez, attorney-general; and Charles H. Skidmore, superintendent of public instruction.

Education.—The University of Utah, Salt Lake City, has an enrolment of 4,334, the Utah State agricultural college, Logan, 3,229, and Brigham Young university 2,782. With an enrolment of 138,047 students and a force of 4,631 teachers and principals and 1,000 other employees, the cost of elementary education was as follows: operating cost, \$9,557,100.47; capital outlay and debt service, \$12,908,713.21. High school diplomas were granted to 7,948.

Agriculture, Manufacturing, Mining.—Mining and agriculture are the State's chief industries. With each of the five principal non-ferrous metals showing an increased value in total output, metal mines in 1939 produced gold, silver, copper, lead and zinc valued at \$62,385,575, a gain of 43% over 1938. Nearly 77% of the total increase was in copper alone.

Manufactured products had an estimated value of more than \$200,000,000, of which mining machinery, shipped to various parts of the world, accounted for \$2,500,000.

Oil refining, now in its third decade, has become a major industry. During 1939 a 442-mi. pipeline was built to carry crude oil from Wyoming fields to Utah refineries.

Utah produced more than \$11,000,000 worth of sugar beets, and increased activity was noted in the cement and plaster making in-

dustry, meat packing, brewing, and canning of fruit, vegetables, and milk.
(F. W. GA.)

Utilities: see PUBLIC UTILITIES.

Uzbek S.S.R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Vaccination: see SERUM THERAPY.

Valdemar (1858–1939), Prince of Denmark, was born at Bernstorff on October 27, the youngest son of Prince Christian of Gluecksburg, later King Christian IX of Denmark. He was the brother of Alexandra, queen consort of King Edward VII. Valdemar married Princess Marie of Orleans in 1885 and of this marriage one daughter, Princess Marguerite, and four sons were born. All the latter except Prince Axel married commoners and renounced their royal rights. Before the World War Valdemar was known as the “uncle of kings,” his nephews then being rulers of Great Britain, Denmark, Greece, Norway, and Russia. He himself declined two thrones—those of Bulgaria and Albania. After his retirement as admiral of the Royal Danish Navy, he helped manage the East Asia Ocean Steamship Line, of which he was a large stockholder.

Prince Valdemar died at Copenhagen on January 14 and was buried in Roskilde cathedral.

Vanadium. Required as a constituent in certain types of high grade alloy steels and cast irons, vanadium is produced in considerable quantities. World production in 1938 was about 3,150 metric tons, of which Peru furnished 47%, United States 25%, South West Africa 16%, and Northern Rhodesia 12%, with small amounts from other sources. There is a growing demand for vanadium catalysts in the production of sulphuric acid and certain organic compounds, as well as in the ceramic and dyeing industries.

(See also RADIUM.)

(G. A. Ro.)

Vandenberg, Arthur Hendrick (1884–), U.S. Senator, was born at Grand Rapids, Mich., on March 22. After graduating from high school he studied for a year at the law school of the University of Michigan but did not complete his course. Instead he began work in 1902 as a political reporter for *The Grand Rapids* (Mich.) *Herald*. Four years later he became editor of this newspaper. His first important political job was as a member of the Republican State Central Committee (1912–18); he was also chairman of the Republican State convention in 1916 and 1928. He resigned his editorship of the *Herald* in 1928 upon his appointment to the U.S. Senate to fill a vacancy, and in November of that year he was elected as a Republican for the regular term. Re-elected in 1934, he was probably as responsible as any other man for preventing the total disruption of the Republican Party in the upper house. His political tactics consisted of building a coalition between members of his party and anti-Administration Democrats. The first major victory of this bloc was the defeat of Roosevelt's Supreme Court bill in 1937, but it also scored such notable minor victories as defeat of appropriations for the Florida Ship canal and Passamaquoddy bay, and by 1939 it was a powerful opponent to almost all legislative programs of the New Deal. With Borah (Rep., Ida.), Nye (Rep., N.D.) and Johnson (Rep., Calif.), Vandenberg in Sept. 1939 became the chief opponent of repeal of the arms embargo in the U.S. Neutrality act. Vandenberg was prominently mentioned in 1936 as a presidential possibility and is a leading candidate for the Republican nomination in 1940, having declared on May 29, 1939, that he would accept it. He is author of two books on Alexander Hamilton and of *The Trail of a Tradition* (1925).

Van Dine, S. S. (WILLARD HUNTINGTON WRIGHT) (1888–1939), U.S. author, creator of the detective character Philo Vance, was born in Charlottesville, Virginia. He was educated at St. Vincent and Pomona colleges in California, and at Munich, Paris, Cambridge, and Harvard. From 1907 to 1913 he was on the staff of *The Los Angeles Times* as music critic and literary editor; from 1912 to 1914 he was editor of *Smart Set*. Later he was critic and editor on the staffs of *The Forum*, *The New York Evening Mail*, *The San Francisco Bulletin* and other publications. Meanwhile he had completed nine serious volumes on art, literature, and philosophy, and had published several music compositions. Overwork caused a nervous breakdown in 1923 and he was in bed for two years. To pass the time he read detective stories, and in 1926 he started writing his own fiction. First of the “Philo Vance” books to appear was *The Benson Murder Case*, followed by *The “Canary” Murder Case* and *The Greene Murder Case*, all written under the pseudonym of Van Dine. These were popular successes and Philo Vance, though deprecated by his creator as quite an ordinary character, found his way into motion pictures. Van Dine died at New York city April 11.

Varnishes: see PAINTS AND VARNISHES.

Vassar College, Poughkeepsie, New York, entered upon its 75th year of instruction in Sept. 1939, having been founded in 1861 and opened in 1865. In the academic year 1939–40, a three-year interdepartmental major field in primitive cultures was established, under the administration of the newly created Division of Anthropology, offering courses in the biological basis of race, European and American archaeology, primitive languages, social organization and religion, and with opportunities for concentrated study in physical anthropology, cultural anthropology or archaeology. Through a five-year grant from the Carnegie Corporation, a program of summer field work in the archaeology of the American Indian in the Hudson River valley was inaugurated under the direction of Dr. Mary Butler.

From the Works Projects Administration the college received a loan collection of the complete records of the Federal Theatre. From the Rockefeller Foundation it received a grant for theatre research based on these records to be supervised by Mrs. Hallie Flanagan, professor of drama and director of the Experimental Theatre at Vassar and former national director of the Federal Theatre. This research will cover preparation of a report summarizing the four years' work of the Federal Theatre, publication of special bulletins describing new techniques in design and production introduced by it, completion of various pieces of theatre research begun by it and indexing of Federal Theatre records.

Students and faculty raised two full scholarships for refugee students, one of which was awarded to a girl from Germany and the other to one from Italy. A third refugee scholarship given anonymously by two alumnae was awarded to a student from Austria. Through a faculty committee a program was put into effect of bringing to the college a succession of displaced European scholars for a fortnight each as visiting lecturers. (H. N. MacC.)

Vatican City State. The Vatican City State, established in 1929 as a sovereign and independent State by the Lateran Treaty between the Holy See and Italy. The total area is 108.7ac., adjacent to Rome, and completely encircled by Italian territory. Within its confines are the basilica of St. Peter, the papal palace, the Vatican library, museums and gardens, together with several smaller edifices. Thirteen buildings in Rome and the papal villa at Castel Gandolfo are recognized parts of the Vatican, and enjoy extra-territorial rights. The population is 1,006.

The Vatican City State constitutes the temporal domain of the papacy. Over it, the pope exercises complete legislative, executive and juridical rights. Administrative matters are in charge of a commission of three cardinals, according to a decree issued by Pius XII in March 1939, and under a layman, as governor. The territory is policed by the papal gendarmes, consisting of about 100 men, and by the famous Swiss, Noble and Palatine guards, mostly decorative. Being a sovereign State it has its own flag, its own coinage and postal service, its own independent press and radio station, enjoys diplomatic immunity and receives representatives from foreign nations. The official publication is the *Acta Apostolicae Sedis*, with a circulation of some 10,000. The *Osservatore Romano*, a semi-official newspaper, with a normal circulation of about 50,000, has increased, since the European war, to 200,000.

The Government of the universal Catholic Church is centred in the Vatican. Here the pope exercises temporal and supreme spiritual power. Here are located the Congregations governing religious matters. Here are received the bishops and ecclesiastical dignitaries from everywhere. Here are accredited ambassadors and ministers from foreign nations, and from here are appointed, by the dual spiritual and temporal powers, papal representatives to the nations. (See ROMAN CATHOLIC CHURCH: *Spiritual and Temporal Relations*.)

As an independent State, and as a spiritual and moral force, the Vatican strove to preserve European peace, and dealt diplomatically with the nations involved. In conflict, as in Russia and Germany, it championed the rights of religion and of its spiritual subjects. With other nations, it aspired to promote friendly relations and to regulate the status of Catholic citizens and subjects. (See also PRUS XII.) (F. X. T.)

Vegetable Oils and Animal Fats.

Domestic fats and oils in the United States in Sept. 1939 rose from the lowest price level in five years, because of speculative movements and economic developments attendant on the advent of war. Oleo oil and oleostearine advanced about 50%, and cottonseed oil, lard, grease, sardine oil, tallow and corn oil about 30%. Of the drying oils, tung and oiticica oils advanced 80% to 100%; linseed about 12%. Teaseed oil, like tung oil, affected by the war in China, advanced 60%. Lard, cottonseed, coco-nut and corn oils declined after the first weeks of war, but oleo, olive, peanut and linseed oils remained fairly steady. The largest production of oils and fats from domestic materials in the United States was estimated for 1939, about 8,500,000,000lb. against 8,000,000,000lb. in 1938 and a five-year average of 7,753,000,000 pounds. World production in 1939 was also estimated as the largest on record, although figures from many countries were not available. On the outbreak of war the Food Ministry of Great Britain requisitioned all fats and oils in the United Kingdom and also all stocks of oils, oilseeds and fats of more than 50 tons held outside the United Kingdom by nationals. Trade was put under a licensing system. Denmark and the Netherlands prohibited exports of most fats and oils. Norway placed oils and fats under the same Government control as oleomargarine.

An amendment to the Philippine Islands Independence Act,

signed by the President Aug. 7, 1939, specified that no export tax would be placed on copra and coco-nut oil shipped to the United States and that beginning with 1940, 440,000,000lb. of Philippine oil would be admitted duty free by the United States, this amount to decrease annually by 5% up to 1946 and then by 3% up to July 4, 1946, the date of Philippine independence. After that the same U.S. tariffs as against other nations would apply. (S. O. R.)

Vegetables: see CORN; LETTUCE; POTATOES; SWEET POTATOES; TOMATOES; TRUCK FARMING; ETC.

Venereal Diseases. Stimulation of venereal disease control work throughout the United States has been accomplished to a great extent by direct grants-in-aid to the States from the Federal Government through the Public Health Service. During the fiscal year ended June 30, 1939, \$3,000,000 was appropriated by the Congress for the control of venereal diseases. Health departments in the 48 States and in many localities made available an additional sum totalling more than \$4,300,000 for the control of syphilis and gonorrhoea. In developing the national program, each State health department is responsible individually for the character and extent of the measures adopted. This permits the development of a campaign in each State which meets local social and economic conditions.

Generally speaking, the principles most frequently followed are: (1) organization, within the State or large municipal health department of an administrative unit charged with the direction of the program—this unit to be directed by a properly qualified full-time venereal disease control officer. At present 31 States have such medical officers.

(2) One of the great present needs is to strengthen the methods for obtaining reliable case reports of patients infected with syphilis and gonorrhoea in the hope of establishing a trend. This phase of the program is being given special study in 16 States. The Public Health Service has aided the State health departments in the introduction of the most modern mechanical statistical methods for collecting and tallying case reports.

(3) The development of sufficient facilities for the adequate treatment of medically indigent patients is a fundamental need for syphilis control. Clinics are important—particularly in urban areas, and should be organized and operated along the most effective lines. Today there are available more than 2,200 clinics for the treatment of syphilis and gonorrhoea, as contrasted with 1,000 in 1936. In rural areas where clinics are not feasible, a satisfactory plan has been adopted which includes the utilization of the services of physicians in private practice. Some State health departments subsidize these physicians for the treatment of indigent persons. In all States the health department distributes anti-syphilitic drugs free to physicians for the treatment of indigent patients. In 1935 a total of 6,500,000 doses of arsenical drugs used in the treatment of syphilis was sold in the United States; in 1938, 10,500,000 doses were sold.

(4) The principle that early diagnosis is essential for the control of syphilis is as true as for any other communicable disease. Darkfield microscopic examinations are now available in many of the venereal disease clinics. Most State health laboratories perform such examinations upon request.

A few years ago, only the effectiveness of the serologic tests for syphilis as performed by the originators of the tests was known. The Public Health Service has in recent years conducted annually studies of the efficiency of performance of serologic tests for syphilis in State laboratories. Encouragement is also being given to similar studies of tests performed in municipal and private laboratories within the States under the jurisdiction of the health department. The information available at present shows that the

Production of Principal Oils and Fats in U. S., 1938 and 1939
(Estimated by the Department of Agriculture)

	1939 lb.	1938 lb.		1939 lb.	1938 lb.
Butter . .	2,300,000,000	2,297,000,000	Oleo Oil .	70,000,000	6,000,000
Lard . . .	2,100,000,000	1,754,000,000	Oleostearine	40,000,000	49,000,000
Cottonseed			Fish Oils .	200,000,000	188,800,000
Oil . . .	1,350,000,000	1,678,000,000	Tallow		
Soybean Oil	500,000,000	323,000,000	(inedible)	900,000,000	762,000,000
Corn Oil .	145,000,000	137,000,000	Linseed .	250,000,000	157,000,000

quality of serologic test performance in State laboratories is from 200% to 300% improved over that of three years ago. In the fiscal year 1939 a total of 5,500,000 serologic tests for syphilis was performed, as contrasted with 2,000,000 in 1936.

(5) Before facilities for treatment were increased to meet more nearly the needs, it was estimated that only half of the people infected with syphilis sought treatment during the early stage. The number infected and failing to seek treatment immediately is still large, but progress has been made through case-finding methods. Most local health departments make provision for proper contact-tracing in early syphilis and the number of people brought under treatment through this means is steadily increasing.

The principle of applying serologic tests to discover syphilis in large population groups is being employed extensively just as laboratory methods have been used to find patients with other communicable diseases. This method of case-finding is employed wherever the prevalence rate for syphilis in the group to be surveyed is believed to exceed the average prevalence rate for the U.S. as a whole.

(6) A special application of the survey of population groups is the employment of serologic tests in premarital and prenatal physical examinations. During 1939 laws requiring blood tests for syphilis before marriage were enacted in 12 States. This increases to 19 the number of States that have such laws. These laws vary to some extent, and it is possible that some may require amendment in the future. All, however, provide for the performance of a serologic blood test for syphilis on both applicants for a licence to marry—the test being part of a physical examination. In most States these laws are waived when there seems to be no danger of transmitting syphilis in marriage, or when the marriage is in the interests of the public welfare. Another important law enacted in 15 States during 1939 has been that which requires that a blood test for syphilis be done on every pregnant woman. Seventeen States in all now have such laws.

(7) Health departments and unofficial agencies continue to cooperate in the national educational program. The press, radio, moving pictures, printed material, and lectures all have their field of usefulness. Generally speaking, the aim of the educational program is to inform the people about the prevalence of syphilis and gonorrhoea, the possibility of preventing infection, the services required should the individual become infected, and the need for Governmental action in providing medical services for indigent patients. (See also CHEMOTHERAPY; PUBLIC HEALTH SERVICES.)

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Venezuela, a federal republic in Northern South America; language, Spanish; capital, Caracas; president, Eleazar López Contreras. The area is 393,976 sq.mi.; the population by the 1936 census was 3,467,839, including 103,492 Indians. The principal cities, with their populations, are: Caracas, 203,432; Maracaibo, 110,010; Valencia, 49,214; Barquisimeto, 36,429; Nirgua, 30,706; Carúpano, 30,163; Maracay, 29,759; Río Caribe, 29,696; Boconó, 25,315; Ciudad Bolívar, 25,134; Puerto Cabello, 22,213; San Cristóbal, 21,874; Cabimas, 21,753; Cumaná, 21,623; La Victoria, 21,372. La Guaira, the port of Caracas, has a population of 9,717.

History.—Under the "Three-Year Plan" inaugurated in 1938, Venezuela continued economically prosperous and politically stable throughout 1939. A contract involving expenditure of 22,479,235 bolívares (nearly \$7,000,000) for new docks and other harbour improvement at La Guaira was made with a Netherlands firm; steps were taken for the modernization of Caracas, and encouragement given to immigration. Important new legislation in-

cluded a petroleum law regulating concessions, an act for the inspection and supervision of insurance companies, and another providing for free legal counsel for workmen. The compulsory profit-sharing law, enacted in 1937, was put into effect early in the year. Bonuses to employees ran as high as 12-45% in some cases. In November, a catastrophic fire completely destroyed the oil town of Lagunillas (pop. 13,922), on Lake Maracaibo, with heavy loss of life and huge property damage.

Venezuela's international relations were featured by cordiality with the United States. Reciprocal exchange of ambassadors (instead of ministers, as formerly) was effected early in 1939. On November 6, a reciprocal trade agreement (effective Dec. 16, 1939) between the two countries was signed. Under it, Venezuela reduced duties on important imports from the United States, while that country halved her tariff on Venezuela petroleum, although limiting importation through a quota system.

Education.—Primary education is compulsory and under Federal control. Considerable advance was made during 1939 in education. In 1938 there were 4,142 primary schools, with 231,554 pupils; 11 normal schools, with 692; and 51 secondary schools with 3,497 students (in addition to those in 24 private secondary schools). Two universities and the geological institute had a combined enrolment of 2,166 in 1939.

Trade and Communication.—Venezuela has extensive steamship communications (under normal conditions), and adequate external air communication. There are 993km. of railways, and a relatively good highway system. The principal highways aggregate 2,761km. in length. In the Orinoco valley transportation is almost entirely fluvial.

In 1938 there were 21,880 telephone stations in service, a gain of 12% over 1937 and more than 36% over 1936. Telegraph traffic in 1938 was over 30% greater than in 1935.

Imports totalled 311,871,006 bolívares in 1938 (United States, 56.2%; Germany, 11.9%; Great Britain, 7%), a slight increase. Machinery, electrical apparatus, and similar commodities aggregated 23% of all imports, textiles 22%, foodstuffs and beverages, 16%. Exports were 888,240,443 bolívares, of which 93.2% were in petroleum products, with coffee, gold, and cacao also important. Some 72% of all exports went to Curaçao in 1938, 13.7% to the United States.

Production.—Venezuela is the third largest petroleum producer in the world, with a 1938 output of 28,071,371 metric tons, almost 10% of the world's total, and the highest Venezuelan production in history. Practically all the petroleum is exported. Taxes derived from it furnish around a third of the national revenue. The chief agricultural product is coffee, with cacao second.

Finance.—The monetary unit is the bolívar (value: \$.31 U.S.). The national debt is approximately 3,000,000 bolívares, all internal, and is probably the lowest per capita of any country in the world. The budget for 1939 called for 335,261,000 bolívares.

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Vermiculite. Its utilization for house insulation has led to a marked increase in the production of vermiculite, a type of mica which expands enormously when heated, thus giving a cellular structure with a large amount of air space. United States production was 20,700 short tons in 1938, a decrease of about 22% from 1937, some of which is exported to Great Britain and continental Europe. Following the successful application in the American market, attempts have been made to exploit deposits in the Soviet Union and South Africa. The chief producing centres in the United States are Montana, Colorado and Wyoming, which makes freight charges a big factor in Eastern consumption.

A two-inch layer of expanded vermiculite is reported to reduce attic heat loss by 75%, and a four-inch layer by 92%.

(G. A. Ro.)

Vermont, fourteenth State of the United States, first to be added to original thirteen, popularly known as the "Green Mountain State"; area, 9,564 sq.mi.; population according to the U.S. census of 1930, 359,611, with slight increase since, both urban and rural. Capital, Montpelier, 8,000. Largest city, Burlington, 26,000. Of the State's population 118,766 are urban, or 30%; 358,965 whites; 568 coloured; 315,904 native-born; 43,061 foreign-born.

History.—During 1939 the milk price situation continued to occupy the attention of the extensive dairy interests of the State. A new milk inspection and licensing law covering retail milk dealers and a new Bang's disease control law came into effect. Rural areas paid more in motor vehicle registration fees, motor fuel taxes and other motor vehicle imposts than urban areas. Motor vehicle inspectors travelled 911,038 miles in State cars at a cost of \$28,517. Motor coach travel service, developing the State as a playground, increased. It is predicted that Vermont's sub-marginal land problem will be reduced to a minimum in the next decade if the present trend of high class summer home development continues. State air service has been materially expanded during the year. The governor was George D. Aiken; William H. Wills, lieutenant-governor; Rawson C. Myrick, secretary; Thomas H. Cave, treasurer.

Education.—The public school system of the State is under the supervision of a State commissioner of education and local union superintendents, the revenues being derived mainly from State and local taxes. A plan for equalization of educational opportunity is being worked out. Vocational training is at present confined largely to agriculture and home economics. School buildings and equipment are being improved and teacher courses and requirements strengthened. There are six colleges and universities, three junior colleges, two State normal schools and a State agricultural school.

Charities and Correction.—The charitable and corrective institutions consist of a State prison and women's reformatory, industrial school, two hospitals for the insane, a school for feeble-minded and a home for children. The public welfare department has new appropriations of \$5,000 a year for 1940 and 1941 to aid adult crippled and \$10,000 for a psychiatric clinic division.

Finances.—The State Treasury reported a balanced budget at the end of the fiscal year ending June 30, 1939. State financial officers have begun issuing reports giving a more accurate picture of State resources. Old age assistance gets the largest increase in appropriations during the next two fiscal years. The State tax department reported a decrease of \$815,530.10 in the appraisal valuation of real estate and a drop of \$14,334.15 in the total general property grand list of the State. The reduction was due largely to property losses incurred in the 1938 hurricane. WPA expenditures were \$3,046,782.02 in Federal funds and \$1,112,082.86 by State and local units. Banks report a decrease in loans on farm lands, a heavy gain in holdings of U.S. Government obligations and a reduction in real estate owned by them. Stabilization of bank deposits is indicated by the smallest decline in deposits in the last ten years.

Industries.—Industries, including mining, have been reasonably steady in their output and employment during 1939. Such industrial growth as the State is experiencing is coming for the most part from within through the development of its own natural resources. Indications are that chemical research as applied to agricultural production may play an important part in this trend.

(L. W. D.)

Veterans' Administration. The following summation shows the number of veterans and deceased veterans whose dependents were receiving pension or compensation benefits as of June 30, 1939:

War	Living Veterans	Deceased Veterans	Total
War of 1812		I	I
Mexican		168	168
Indian	2,525	4,251	6,776
Civil	3,516	57,915	61,431
Spanish-American			
Service connected	1,686	1,483	3,169
Non-service connected	163,912	54,339	218,251
Special acts	112	60	172
Total Spanish-American	165,710	55,882	221,592
World War (War Time)			
Service connected	342,072	99,822	441,894
Non-service connected	52,936	12,220	65,156
Total World War	395,008	112,042	507,050
Regular establishment	34,185	9,415	43,600
Grand total	600,944	239,674	840,618

Insurance.—As of June 30, 1939, benefits provided for under Term and Automatic Insurance were being paid in monthly instalments to 11,134 permanently and totally disabled veterans and to the beneficiaries of 19,097 deceased veterans. The disbursements for the above benefits during the fiscal year 1939 approximated \$38,393,938.70.

As of June 30, 1939, there were 605,716 United States Government life insurance policies in force, having a face value of \$2,561,712,315.

As of the above date monthly payments were being made, from the United States Government life insurance fund, to 10,495 permanently and totally disabled veterans.

Emergency Officers' Retirement Pay.—As of June 30, 1939, there were 1,813 emergency officers receiving retirement pay for disabilities incurred during the World War. The annual disbursement for this form of benefit during the fiscal year 1939 approximated \$2,991,326.30.

Guardianship.—The Veterans' Administration, in order to safeguard all monies paid by the Government in the form of pensions and compensation to incompetent or minor beneficiaries, maintains a close supervision of all guardianship activities.

The following summation shows the number of fiduciaries under supervision as of June 30, 1939, subdivided by types of beneficiaries:

	Incompetents		Minors	Total
	Veterans	Others		
Fiduciaries acting for wards of all wars:				
Guardianship for	38,169	4,514	18,643	61,326
Legal custodians for	38	68	8,962	9,068
Institutional awards	587	..	..	587
Total	38,794	4,582	27,605	70,981

Hospital and Domiciliary Care.—As of June 30, 1939, 54,117 beneficiaries were receiving hospital care and 15,426 were receiving domiciliary care authorized by the Veterans' Administration.

Of the number under hospital care, 4,979 were receiving treatment for tubercular ailments, 31,216 for neuropsychiatric diseases, 17,922 for general medical and surgical conditions.

There were 288 patients under observation, 58 were receiving temporary hospitalization, and 273 non-veteran patients were not classified as to type of disease.

The table on the next page does not include loans made to veterans secured by U.S. Government life insurance policies.

The total amount includes \$1,179,002,368.67 made available by deduction for allotment from the pay of World War veterans while in service, from amounts collected as premiums on the various forms of Government insurance, and amounts in other trust funds.

Total Disbursements to June 30, 1939

Compensation and pensions:	
World War	\$ 3,838,831,444.82
All other wars	9,692,849,075.74
Regular establishment	170,862,379.65
Payment to participants in yellow fever experiments	148,013.75*
Military and naval insurance	2,127,399,092.85
U.S. Government life insurance	378,378,768.63
Adjusted service certificates	3,739,878,169.54**
Adjusted service and dependent pay	52,986,457.12
Adjusted service and dependent pay 1937 and 1938	999,047.32
Loans to veterans for transportation	76,103.36
Hospital and domiciliary facilities and service (Constr.)	109,627,659.65
Vocational training	644,887,407.18
Allotments and allowances	582,941,886.07
Marine and seamen's insurance	35,078,013.20
Salaries and expenses (general administration)	1,960,998,600.61
Administrative expenses, Adjusted Compensation Payment Act, 1936	3,695,743.02
Printing and Binding	2,107,961.99
National Industrial Recovery Act. V.A. 1933-30	3,018,704.79
Public Works Administration Act of 1938 (Allotment to V.A.) 1938-1940	4,354,999.35
Horatio Ward Fund	21,742.33
General Post Fund	1,681,373.10
Funds due incompetent beneficiaries	565,482.25
Personal funds of patients, V.A.	7,956,172.33
Miscellaneous	901,921.07
Total	\$23,360,159,129.72

* Disbursements from June 30, 1931, to June 30, 1939.

** This amount represents payments made on adjusted service certificates and amounts reimbursed to the U.S. Government life insurance fund on account of loans made from that fund on certificates under the provisions of the World War Adjusted Compensation Act as amended, and the Adjusted Compensation Payment Act, 1936.

(See also ADJUSTED COMPENSATION.)

(F. T. H.)

Veterans of Foreign Wars.

The security of America was the guiding motif of the 1939 program of the Veterans of Foreign Wars of the United States, conducted through the nation-wide activities of more than 3,700 local V.F.W. units. Co-ordinated and directed by national V.F.W. committees and officers, the program of the organization, adopted by its 40th annual national encampment at Boston, Aug. 27-Sept. 1, 1939, included the following objectives: Adequate provision for America's disabled veterans; pensions for needy widows and orphans of all war veterans; pensions for all disabled war veterans; unalterable opposition to Communism, Fascism, and Nazism in America; maintenance of U.S. Constitutional rights of free speech, a free press, religious freedom, and rights of petition and assembly; a national defence that will guarantee security for America; enactment of a measure to take the profits out of war; neutrality for the United States in disputes between other nations.

Outstanding among the national V.F.W. activities for 1939 was its sponsorship, in the 76th Congress, of S. 1885, introduced in Congress on March 21, 1939, a proposal to take the profits out of war by taxing the profits out of war.

Other legislation instituted or supported by the V.F.W. in the 76th Congress included Public Law No. 196 which restored to a group of approximately 1,100 World War veterans compensations denied them by the Economy Act of 1933. Public Law No. 198, signed by the President on July 19, 1939, was a V.F.W. bill which liberalized eligibility to World War widows' pensions, increased from \$22 to \$30 a month the pensions of World War widows, increased widows' pensions in cases where the veterans died of service-connected disabilities and otherwise effected changes in existing laws concerning widows and orphans and veterans' benefits.

Progress also was achieved by the V.F.W. in its efforts to obtain wider veteran preference privileges in Government employment. As approved on June 30, 1939, the Emergency Relief Appropriation Act, Public Resolution No. 24, included provisions requiring employment or retention in employment on WPA projects of veterans (first) and other American citizens (second).

Consistent with its demand of many years for an adequate and effective national defence for the United States, the V.F.W. vigorously supported in the 76th Congress legislation providing more expansive and larger appropriations for national defence purposes than during any previous session of Congress since the World War.

One of the outstanding events of the year 1939 was the celebration on September 23, of the 40th birthday anniversary of the Veterans of Foreign Wars of the United States. Founded on Sept. 23, 1899, by a group of 13 Spanish-American War veterans at Columbus, Ohio, the organization now numbers approximately 250,000 veterans of the War with Spain, the Boxer Rebellion, Philippine Insurrection, World War, Nicaraguan campaigns and other armed expeditions under the Stars and Stripes during the last four decades.

The 1939-40 national officers of the Veterans of Foreign Wars of the United States are: Otis N. Brown, Greensboro, N.C., commander-in-chief; Dr. Joseph C. Menendez, New Orleans, La., senior vice commander-in-chief; Max Singer, Brighton, Mass., junior vice commander-in-chief; Robert B. Handy, Jr., Kansas City, Mo., adjutant-quartermaster general; Robert T. Merrill, Havre, Mont., judge advocate general; Dr. S. C. Bostic, New York City, surgeon general; Rev. Daniel F. Monaghan, Milan, Ill., national chaplain. National headquarters is maintained in the Medical Arts building, Broadway at 34th street, Kansas City, Mo.

(B. Y.)

Veterinary Medicine.

During the year 1939, the Federal Government established four research laboratories devoted exclusively to the study of poultry diseases and nutrition. These laboratories have been provided with well-appointed buildings, grounds, modern equipment, and capable personnel, and Congress has appropriated ample funds to carry out designated projects at each of them. John R. Mohler, chief of the Bureau of Animal Industry, United States Department of Agriculture, is charged with the supervision of this vast undertaking.

State universities of the principal States give short courses in avian medicine to veterinarians. Veterinary societies hold special sessions for that branch of their work. Fulltime poultry pathologists are now employed by some of the veterinary colleges.

Although the knowledge acquired through these intensive studies exceeds its rational application, the new relation of veterinary medicine to the development of this basic source of food supply is a matter of considerable national significance. The intent is to give poultry production the same scientific background as the other branches of American animal industry.

Rabies.—Increased interest in the eradication of rabies in animals was an incident of 1939. The occurrence of rabies in dogs and farm animals has mounted to such a height that dog societies which formerly questioned the very existence of the disease are requesting the Federal Government to assume the responsibility of controlling this terrifying scourge.

At the 1939 session of the American Veterinary Medical Association it was resolved that rabies could be easily eradicated by merely enforcing the usual measures governing the control of infectious diseases. To accomplish that end, it was recommended that the rabies problem be placed in the hands of the Federal and State veterinary services instead of leaving the enforcement of regulatory laws in the hands of local authorities who, regardless of their good intentions, are unable to overcome the prejudice against their efforts. The consensus was that rabies will vanish when eradicated from the domestic dog—the main reservoir of rabies virus. Much of the controversy over the handling of rabies centres around the compulsory use of rabies vaccine.

Equine Encephalomyelitis.—A strange event of the year was the sudden disappearance of encephalomyelitis of horses. Although the disease was unusually prevalent for several years in certain States bordering on the Mississippi and westward, only unconfirmed isolated cases occurred in 1939. A chemically killed virus vaccine was discovered in 1938 at the Rockefeller Institute of

Medical Research. Its immunizing value is practically faultless but whether its extensive use in 1938 and the spring of 1939 or unknown climatic influences account for the sudden disappearance is problematical but the fact remains that the suddenness of the change was spectacular. The occurrence of the disease in human beings, here and there, who were exposed to affected horses and the endemic in Massachusetts in 1938 gave this virus infection of horses the wide prominence which spurred the Federal and State services to institute active control measures.

Bovine Brucellosis.—The eradication of bovine brucellosis, commonly named contagious abortion or Bang's disease, continues under considerable difficulty. Prominent States refused to appropriate funds for work during 1939. The project has two schools of thought. The one favours the test-and-slaughter method, the other favours vaccination with avirulent cultures of Bang's bacillus. The former plan includes the payment of indemnities for the condemned animals. Collecting blood samples, sending them to a laboratory to test their agglutinating power, the keeping of records, and appraising the condemned, is a costly procedure and it is pointed out that a comparable disease—bovine tuberculosis—required 22 years of constant work and vast sums of money to reduce to a point of practical elimination throughout the United States. On the other hand, vaccination holds out hope of immediate results on a large scale at but nominal expense. The controversy is unsettled but the trend appears to lean toward vaccination under definite regulation.

The reported increase of brucellosis in man (undulant fever) has not impressed the public mind sufficiently to build up a demand for the eradication of the disease in cattle. Farm economics rather than public health still governs. The transmissibility of the disease to man, the lowered calf and milk production in infected herds, and recent observation that the incidence of mastitis is much lower in disease-free herds, have made the economic and public health phases of bovine brucellosis inseparable. The potentiality of all this became more generally comprehended during 1939.

Blacktongue.—Among recent researches of practical value are those of Elevjhem and Arnold of the University of Wisconsin who demonstrated experimentally that a fraction of the vitamin B complex—nicotinic acid—prevents blacktongue, a fatal, pellagra-like disease peculiar to dogs. In their hands, a ration depleted of this fraction caused blacktongue in its typical form. This work is noteworthy because it transposed to the list of preventable diseases a grave and quite common malady of the canine species. Moreover, it furnished additional proof of the relationship of diet to a definite clinical entity.

Fright Disease.—Another discovery of the same class as the foregoing was that of J. W. Patton, D.V.M., of East Lansing, Mich., who demonstrated experimentally that thiamin chloride, also a fraction of the vitamin B complex, prevents and cures the nervous disorder of dogs known as fright disease or running fits. By alternately depleting and replenishing the ration of the same group of dogs in such a way as to regulate the intake of thiamin chloride, a nervous crisis clinically analogous to fright disease was produced and cured at will with mathematical precision. Whether this discovery is applicable to other nervous phenomena affecting animals remains to be proved.

Modified Canine Distemper Virus.—A modified canine distemper virus that is avirulent for dogs, foxes, and mink and yet retaining high immunizing properties was developed by Green and Swale working among fur-bearing animals in Wisconsin. The virus is modified to the avirulent state by 50 or more passages through ferrets. At 20 passages, the virus recovered from the inoculated ferrets is still virulent but at 50 passages and upward it has lost its pathogenic power without, however, losing its ability

to confer immunity. The usefulness of this virus-vaccine has been proved by its use in thousands of foxes and several hundred dogs. The exact value in the domestic dog under natural conditions has, however, not been determined.

Mastitis.—On account of their insidious nature and prevalence bacterial diseases of the mammary glands of cows impose a difficult problem. The cow, the udder, and the particular quarter affected must be detected, in order to obtain a correct tableau of the herd's fitness to supply wholesome market milk. For this purpose a colorimetric test has been employed. A dram of milk is drawn into a test tube from each quarter and treated with a few drops of brom thymol solution. The colour changes in the milk samples determine the presence or absence of bacterial infection. (L. A. M.)

Victoria. Area 87,844 sq.mi.; pop. (est. March 31, 1939) 1,880,241. Chief towns (pop. Dec. 31, 1938): Melbourne (1,035,600); Geelong (40,050); Ballarat (38,430); Bendigo (30,030). Governor: Maj.-Gen. Sir W. J. Duggan.

History.—Following a very severe heat-wave in Jan. 1939 the most disastrous bush-fires in the State's history cost 67 lives and ravaged over 4,000,000 acres of valuable forest and grazing land, destroying several townships, thousands of head of stock and 1,000,000,000 feet of timber. A relief fund opened in Melbourne realized £248,000, and contributions came from elsewhere in Australia. A Royal Commission appointed to inquire into the causes of the outbreak and to suggest preventive measures for the future reported critically upon the Government's administration of forests. The wheat areas suffered not only from the drought but also from the worst floods for 20 years, which caused considerable loss at Easter in the north and north-west. A sum of £200,000 was made available for the relief of wheat growers.

Mr. Dunstan's government, the first Country Party administration in Australian history, remained in office throughout the year. An estimated surplus of £12,000 for the financial year 1938-39 became a deficit of £787,000 owing to the adverse seasonal conditions. The treasurer, in estimating a surplus of £4,000 for 1939-40, announced increases in the rates of company and individual income tax. Labour made substantial gains at the Melbourne City Council election in August. There was continued activity in the building trade. Progress was made with re-housing schemes in Melbourne, and with factory construction there and in Geelong. Manufacturing industries were prosperous, and factory employment high, chiefly in industries engaged in executing the Commonwealth government's defence orders. (L. R. Mc.)

Finance.—In 1937-38: Revenue £A28,938,052; expenditure £A28,907,107; debt outstanding (June 30, 1938) £A177,228,495.

Communications.—Roads and streets fit for motor traffic (Sept. 30, 1937) 104,087 miles. Railways (1937-38) 4,721 miles. Motor vehicles licensed (1937-38): cars, trucks, etc., 220,753; cycles 27,333. Wireless receiving set licences (Dec. 31, 1938) 322,885. Telephones (June 30, 1938) 198,761.

Agriculture, Manufactures, Mineral Production.—Production in 1938-39: wheat 18,104,360 bu.; wool 170,465,985 lb.; coal, brown (1938) 3,675,450 tons; gold (1938) 144,243 fine ounces. Industry and labour, 1938-39: factories 9,241; employees 201,789; gross value of output £A157,050,725; unemployment (Trade Union returns, average) 10.0%.

Vinyon: see CHEMISTRY, APPLIED; COTTON; INDUSTRIAL RESEARCH; RAYON.

Virginia, one of the original States of the United States, popularly known as "The Old Dominion"; first settled permanently in 1607; area 42,627 sq.mi.; population accord-

ing to U.S. census of 1930, 2,421,851; estimated July 1, 1939, 2,476,532; capital, Richmond, 182,929; seaport, Norfolk, 129,710. Of the State's population in 1930, 785,537 were urban, or 32.4%; 1,770,405 white; 650,165 coloured; 1,746,585 native white; and 23,820 foreign born.

History.—James H. Price is governor; Saxon W. Holt, lieutenant-governor; Raymond L. Jackson, secretary of State; and Abram P. Staples, attorney-general. Virginia's general election was marked by apathy for the most part. When the General Assembly meets in 1940, Democrats will hold all except three Republican seats in the Senate and seven Republican and two Independent seats in the House.

Education.—Virginia has a free school system for children from seven to 20, inclusive, which is compulsory for all between seven and 15 years. Physical training is obligatory; whites and Negroes have separate schools. The amended school census of 1935 recorded 735,198 children between seven and 19, inclusive; public school membership was 575,999 in 1938-39 session, for which total disbursements, including capital outlay of \$6,918,864.14, and debt service of \$2,217,238.49, were \$31,981,207.41, at per capita cost of \$64.82 based on the average daily attendance; length of school year, 180 days; 17,310 teachers were employed at average salary of \$837; average salary of teachers including supervisors and supervising principals, \$940; school property was valued at \$81,524,737. State expenditures for all educational purposes for fiscal year ending June 30, 1939, were \$21,103,822.84, 23.85% of total State expenditures. The State Board of Education accredited 38 institutions of higher learning. In 10 State-supported colleges, 26,701 attended 1938-39 regular sessions.

Public Welfare and Health.—Total State expenditures on public welfare for year ending June 30, 1939, were \$7,451,774.39, 8.42% of total State expenditures. There was \$1,819,663.91 spent on penal institutions; \$227,502.09, on industrial schools; \$1,897,856.64, on mental institutions; and \$1,791,870.04 was spent on non-institutional activities. State, Federal and local funds made a total of \$3,158,960.66 for public assistance in Virginia. Old age assistance applications were made by 225,231 persons, of which 15,237 were approved for an average grant of \$9.63 per case per month; 1,314 out of 1,717 applications for aid for dependent children were approved for an average grant of \$22.51 per month for each family of children; and approximately one-half of the 72,289 applications made for general assistance were for direct aid and the other half sought enrolment in Federal relief projects; 53,271 were approved for the service or assistance for which they applied. For the same period 29 rural health departments in 47 counties served 59.4% of Virginia's rural population. State expenditure on public health was \$1,964,362.09, 2.22% of total State expenditure.

Banking and Finance.—Jan. 1, 1939, Virginia had 187 licensed State banks and 132 national banks. Total assets of State banks, \$268,409,000; of national banks, \$406,417,000; combined total assets, \$674,826,000. Combined liabilities of State and national banks included aggregate deposits, \$585,327,000; capital stock, \$45,090,000; surplus, \$24,803,000; and net undivided profits, \$9,666,000. June 30, 1939, cash surplus in State treasury, \$11,597,799.36; gross bonded debt, \$20,813,064.02; assets in sinking fund, \$5,166,845.87; net debt \$16,646,218.15; no floating debt. Revenues and expenditures for fiscal year 1938-39 were \$92,930,621.11 and \$88,486,586.77, respectively. Assessed values of all taxable property in 1938, \$2,164,664,264.92.

Agriculture and Manufacturing.—The estimated 1939 total farm income, \$119,636,000, is 5% less than 1938. Forecast of crops, Nov. 1, 1939: bales: cotton, 12,000; bushels: apples (commercial), 7,500,000; barley, 2,400,000; buckwheat, 196,000; corn, 36,166,000; cowpeas, 105,000; oats, 2,020,000; peaches, 990,000;

pears, 189,000; potatoes, 6,873,000; rye, 588,000; soybeans, 375,000; sweet potatoes, 4,420,000; winter wheat, 7,946,000; pounds: peanuts, 184,800,000; tobacco, 130,198,000; tons: tame hay, 1,010,000. For the year 1938, a total of 2,316 manufacturing plants reported to the Department of Labor and Industry; their total wages, \$128,154,910, were paid to 160,451, the average number of wage earners; cost of their materials was \$509,178,382; and the value of their products was \$945,221,659. (J. S. Br.)

Virginia, University of. A State institution for higher education situated at Charlottesville, Va. The original university was designed and built by Thomas Jefferson. There are six departments; two academic—the college and department of graduate studies; and four professional—law, medicine, engineering and education. The institution has a productive endowment fund amounting to \$11,028,877, and receives from the State an annual appropriation of \$726,360.00 (1938-39). The total budget for 1939-40 was \$2,658,604.00. The corporate name of the university is "The Rector and Visitors of the University of Virginia." In 1939 the faculty and officers numbered 269 (professors and instructors); the students 2,934 (132 women; 2,802 men). Number of books in the library, 323,500.

The most significant developments in the physical plant of the University in 1939 were the completion of construction of the Neuro-Psychiatric Wing of the Hospital of the Medical School; and the Restoration of the Rotunda of the University, which is the central architectural building, designed and built originally by Thomas Jefferson. (J. L. N.)

Virgin Islands, a United States West Indian dependency east of Puerto Rico, comprising St. Croix, St. Thomas, St. John and smaller islands; language, English; capital, Charlotte Amalie (on St. Thomas); governor, Lawrence W. Cramer. The area is 133 square miles. Population (census, 1930) is 22,012 (a decrease of almost 16% since 1917 and less than half the early 19th century total), and is largely Negro and mixed. The principal cities are Charlotte Amalie (7,036), Christiansted (3,767), and Frederiksted (2,698). Government is administered by a governor appointed by the President of the United States, with legislative functions vested in the municipal councils of St. Croix and St. Thomas. Suffrage has been universal since 1938.

Developments during 1939 continued to be featured by economic rehabilitation. The United States policy of strengthening defences in Puerto Rico and the Virgin islands resulted in the allocation of \$350,000 for construction of additional naval facilities at Charlotte Amalie. External communication is by regular shipping services from New York and Puerto Rico, and by Pan American Airways. The islands depend primarily on sugar and rum, although economic diversification is being pushed, especially through the federally controlled Virgin Islands Company. A tourist trade is growing rapidly. In the year 1938, imports were \$3,345,363 (foodstuffs, 16.8%; fuel oil, 9.7%; machinery and vehicles, 4%), with 70.5% from the United States. Exports were \$1,294,285 (sugar and alcoholic beverages 55.8%), 94.4% to the U.S.

The monetary unit is the United States dollar. The United States contributed \$70,000 toward the operating expenses of the Virgin islands in 1939, as against \$140,000 in 1936. During 1939 there was considerable agitation to have customs receipts (which at present go into the United States Treasury) turned over to the Virgin Islands Government. Almost a fourth of the total expenditures go to education. There are 26 public and private schools, with total enrolment (1939) of 4,719, an increase of 1,470 in three years. Over 90% of the population is literate.

Vital Statistics: see BIRTH STATISTICS; DEATH STATISTICS; INFANT MORTALITY; MARRIAGE AND DIVORCE; SUICIDE STATISTICS.

Vitamins. During 1939 the structures of at least two vitamins have been determined and proved by synthesis. Further evidence of the nutritional significance of riboflavin and other members of the vitamin B complex has become available. Great interest in the practical applications of the newer knowledge has been evinced by numerous discussions of problems involved in retaining or restoring essential vitamins in processed foods.

A number of investigators in the research laboratories of Merck and Company, Rahway, N.J. especially Stiller and Harris and their collaborators, have succeeded in determining the structure of vitamin B₆ and in synthesizing the active compound. Vitamin B₆ is one of the less well known water-soluble factors found in yeast and other foods and known to be necessary for the prevention or cure of a dermatitis in experimental rats. The substance has now been shown to be 2-methyl-3-hydroxy-4:5-di-(hydroxymethyl) pyridine. After the pure compound was made available, Spies and his collaborators soon found that it may be of value, along with nicotinic acid and riboflavin, in the treatment of the multiple vitamin deficiency disease, pellagra.

Investigations in several laboratories have resulted in the accumulation of much more information about the chemical nature of vitamin K, the fat-soluble factor which prevents a haemorrhagic condition in animals fed diets lacking this vitamin. Previous reports have shown that administrations of vitamin K and bile are of great benefit in controlling the post-operative haemorrhages which often followed surgical operations for the relief of biliary obstruction. Vitamin K is found in some plant tissues such as alfalfa and it can be synthesized by certain bacteria such as the organisms which are responsible for the putrefaction of fish meal. Preparations of the pure vitamin have been obtained from both plant and animal sources, and in addition, synthetic organic compounds have been prepared which exhibit a vitamin K activity. It now appears that there is a group of substances related to alphanaphthoquinone and having the biological effects of vitamin K. It has been found that the vitamin K in alfalfa is 2-methyl-3-phytyl-1,4-naphthoquinone.

Riboflavin long has been known to be an essential constituent of one of the enzyme systems of the body which is concerned with the oxidation of organic food materials. No evidence of its importance to man was available until Sebrell and Butler described the symptoms which appeared in women who had been maintained on a diet deficient in riboflavin. The lesions observed consisted of macerated areas which progressed to transverse fissuring in each angle of the mouth. Other lesions of the mucosa of the lips and the skin around the nose and eyes were described. All of these lesions disappeared after the oral administration of synthetic crystalline riboflavin. Similar symptoms have been observed in pellagrins by Vilter, Vilter and Spies. These observations emphasize the view that nutritional deficiencies of man usually are multiple in nature.

Accumulating information regarding the vitamin intake of man has been summarized by Cowgill and emphasizes the desirability of increasing available supplies of vitamin B₁ in foods. The Council on Foods of the American Medical Association favours the addition of vitamin B₁ to ordinary wheat flour and to processed cereal foods to the extent that these foods, which make up so large a part of the modern diet of civilized man, may have the full vitamin B₁ value of the whole grain.

Vitamin B₁ is known to be concerned with the proper utilization within the body of carbohydrate. Stirn, Arnold and Elvehjem have described some interesting experiments in which polyneuritic animals had their symptoms alleviated by increasing the fat con-

tent of the diet at the expense of carbohydrate. Numerous studies of chemical methods for the determination of vitamin B₁ have been made, but the evidence is too recent to permit a critical evaluation. At the present time biological assay remains the method of choice. (See also ALIMENTARY SYSTEM, DISORDERS OF; CHEMISTRY; CHEMISTRY, APPLIED; CHEMOTHERAPY; DENTISTRY; DERMATOLOGY; DIETETICS; EYE, DISEASES OF; FLOUR AND FLOUR MILLING; LEPROSY; MEDICINE; NERVOUS SYSTEM; PHYSIOLOGY; SURGERY.)

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Vocational Education: see EDUCATION, VOCATIONAL; PSYCHOLOGY, APPLIED: *Vocational Psychology*.

Vocational Psychology: see PSYCHOLOGY, APPLIED: *Vocational Psychology*.

Von (in personal names): see under proper names.

Wages and Hours. During the first 10 months of 1937 employment and payrolls in manufacturing and some of the non-manufacturing industries approximated 1929 levels. In Nov. 1937, employment fell off sharply. Payrolls during 1938 averaged only 70% of the 1937 payrolls. The recession in employment affected all of the major branches of industry, both manufacturing and non-manufacturing. It was accompanied by lower average hours per week, average earnings per hour, and average earnings per week in 1938. But in Feb. and Aug. 1939, selected as representative months, weekly hours were typically from two to six hours per week below the corresponding months in 1937. Weekly earnings in a large number of industries approximated those for the corresponding months in 1937; in some cases slightly exceeding the 1937 earnings, in more cases being slightly below them. This was due to a rise in average hourly earnings in a large number of industries ranging from two to eight cents above the figures for the corresponding months in 1937, and typically exceeding the 1937 earnings by five or six cents per hour.

Table I. *Employment, Payrolls and Earnings in Manufacturing Industries*

(Indexes are based on 3-year average, 1923-25=100, and are adjusted to 1935 census of manufacturers. Not comparable to indexes published by the U. S. Bureau of Labor Statistics prior to August 1938.)

	All Manufacturers				Durable Goods				Non-Durable Goods			
	Employment		Payrolls		Employment		Payrolls		Employment		Payrolls	
	1939	1938	1939	1938	1939	1938	1939	1938	1939	1938	1939	1938
Jan. . .	89.5	87.8	83.4	75.0	81.6	81.7	76.6	67.1	67.1	93.7	91.0	84.0
Feb. . .	90.7	88.2	85.5	76.9	82.6	80.1	78.5	67.2	68.4	95.9	93.3	87.8
March . .	91.4	87.7	86.0	77.1	83.5	79.3	80.1	67.4	68.9	95.8	94.6	87.9
April . .	91.2	85.7	84.9	74.6	84.1	77.0	80.2	65.6	68.0	94.0	92.2	84.7
May . .	91.1	83.4	84.9	72.9	83.3	75.0	79.5	64.2	66.7	91.5	89.0	82.6
June . .	90.6	81.6	85.9	70.8	83.9	72.4	81.4	61.7	67.0	90.3	91.0	80.9
July . .	90.5	81.9	83.9	70.6	82.1	70.3	76.6	58.6	63.5	92.9	92.1	84.1
August . .	90.4	85.7	89.8	76.9	84.1	71.7	81.6	63.7	108.1	99.0	99.0	91.7
Sept. . .		88.8		81.0		75.3		68.7		101.6		94.0
Oct. . .		89.5		83.8		70.0		75.2		99.4		93.4
Nov. . .		90.5		84.1		82.2		78.3		98.3		92.5
Dec. . .		91.2		86.5		83.1		80.3		98.8		93.4

This table compiled from tables published monthly in *The Monthly Labor Review*, United States Bureau of Labor Statistics.

The rise of average hourly earnings from 1937 to 1939 was an unusual event. In periods of increased unemployment, such as prevailed from late 1937 through 1938, labour ordinarily experiences reductions rather than increases in average hourly earnings. The contra-cyclical rise in hourly earnings 1937-39 appears to have been the result principally of the upsurge of unionism which began in 1933-34. By 1937 a large number of the new unions had become sufficiently consolidated and effective, and the older unions sufficiently strengthened, so that their increased bargaining power more than counterbalanced the temporarily adverse business trend of late 1937 and 1938 and enabled them, both in union and non-union industries, to push the wage level higher.

Table II reveals that the various industries were affected to different degrees by the recession of 1938 and the trend to recovery in the middle of 1939. Wholesale and retail trade, hotels and public utilities experienced but small reductions in hours from 1937 through 1938-39. They are industries which operate standardized hours if they operate at all and their employees' hours reflect the operating habits of the industries. But the Bureau of Labor Statistics figures show a downward trend of hours in these industries as well as in manufacturing, mining and construction during the period, and it is probable that it was in part due to reductions in hours-standards effected by union agreements. The rise in hourly earnings rates in 1938-39 as compared with 1937 may be illustrated by a few typical cases. The facts shown by these cases are not, of course, universal but they reflect the dominant trends of the period.

The much higher hourly earnings in some industries are due to one or more of the following factors: (1) character of the labour supply employed, as to sex, age and skill, (2) productivity of the industry, principally determined by its degree of modernization, technical equipment and proportion of skilled workers, (3) degree to which union working conditions prevail, (4) necessity of paying high wages to attract labour supply.

Weekly earnings are really of greater significance than hourly rates, from the point of view of living standards. The showing is definitely less favourable when weekly earnings are examined than when the hourly earnings column alone is inspected. There were only five industries of the 24 studied in which average

Table III. Rise in Hourly Earnings Rates in 1938-39
Compared with 1937

Industry	Hourly earnings in February		
	1937	1938	1939
Manufactures in general	\$.602	\$.656	\$.649
Durable goods manufactures . . . . .	.651	.724	.726
Non-durable goods . . . . .	.551	.594	.586
Iron and steel . . . . .	.671	.760	.754
Machinery . . . . .	.643	.739	.725
Lumber and products . . . . .	.461	.515	.520
Food and products . . . . .	.561	.609	.632
Tobacco products . . . . .	.437	.460	.474
Rubber products . . . . .	.748	.773	.760
Anthracite mining . . . . .	.794	.931	.920
Bituminous mining . . . . .	.797	.871	.892
Wholesale trade . . . . .	.672	.686	.711
Building . . . . .	.874	.938	.943

weekly earnings exceeded \$30 per week in Aug. 1939, and the maximum was \$33.87 in the crude petroleum and electric light and power industries. The lowest weekly earnings were in hotels, \$15.13.

Eight industries fell between \$20 and \$25 per week and nine between \$25 and \$30; three below \$20.

Another point should be noted in this connection. After calling attention to the wide variations in both hours and earnings which are found within each industry, both geographical variations and establishment variations, the U.S. Bureau of Labor Statistics pointed out that "there are indeed few industries that do not have submarginal fringes which create problems of a serious nature." (*Monthly Labor Review*, Nov. 1937, p. 1060.) It is these fringes which create many of the problems the Federal Wages and Hours Law was intended to remedy.

The wages of farm labour were closely similar in 1939 to 1938, judging by the reports of the U.S. Bureau of Agricultural Economics.

Monthly wages, with board, averaged \$28.28 in 1939, and \$28.25 in 1938; daily wages with board \$1.35 in Oct. 1939 and \$1.36 in 1938.

(See also LEGISLATION, FEDERAL; TEXTILE INDUSTRY; UNEMPLOYMENT; UNITED STATES.)

(D. D. L.)

Great Britain.—In the early part of 1939 the upward movement of wages was resumed on a small scale, the recorded in-

creases in weekly wages up to the end of August amounting to £114,000, as against decreases of £39,000. The rapid rise in prices after the outbreak of war naturally led to demands for higher wages; and by the end of November the total recorded net increases in weekly wages amounted to £650,000. The cost of living was practically the same at the outbreak of war as it had been a year before; but in September prices rose sharply, and by the beginning of December the official index of the cost of living stood at 173 (July 1914=100), as compared with 155 on September 1. Earnings, meanwhile, rose on account of more regular employment and overtime in the war industries, but fell in many consumers' and export trades which were dislocated by war conditions. In general, pur-

Table II. Average Hours per Week, Average Earnings per Hour and Average Weekly Earnings in
Major Industrial Classifications, February and August, 1938 and 1939.

(Compiled from *The Monthly Labor Review* of the United States Bureau of Labor Statistics)

Industry	Average Hours per Week				Average Earnings per Hour				Average Earnings per Week			
	1939		1938		1939		1938		1939		1938	
	Feb.	Aug.	Feb.	Aug.	Feb.	Aug.	Feb.	Aug.	Feb.	Aug.	Feb.	Aug.
ALL MANUFACTURING INDUSTRIES	36.9	38.0	34.3	36.3	\$.649	\$.639	\$.656	\$.649	\$24.06	\$24.53	\$22.30	\$22.84
Durable Goods	36.4	38.3	33.2	35.4	.726	.716	.724	.702	26.86	27.94	23.80	24.87
Non-durable Goods	37.3	37.7	35.3	36.9	.586	.579	.594	.578	21.47	21.60	20.86	21.25
Iron and Steel (not including machinery)	35.3	37.0	28.9	32.4	.754	.756	.760	.753	26.68	28.13	21.54	24.12
Machinery	37.6	39.0	34.6	34.6	.725	.721	.739	.720	27.31	28.07	25.48	25.03
Transportation equipment	34.3	38.1	30.4	35.3	.897	.888	.886	.883	30.69	33.38	26.86	30.94
Non-ferrous metals	38.3	39.4	33.8	36.2	.665	.668	.670	.666	25.45	26.24	22.64	24.14
Lumber and products	37.9	39.5	36.5	40.5	.520	.541	.515	.523	19.80	21.21	18.69	21.02
Stone, clay, glass	35.7	37.7	33.1	35.9	.648	.647	.649	.634	23.41	24.26	21.47	22.77
Textiles and products	36.1	36.1	32.4	34.7	.489	.479	.510	.480	17.32	17.22	16.41	16.84
Leather and products	39.1	37.4	36.0	38.4	.539	.526	.516	.503	20.34	19.65	19.09	16.76
Food and kindred products	39.8	40.5	40.7	39.7	.632	.595	.600	.586	24.80	23.93	24.74	23.17
Tobacco manufactures	32.0	36.9	33.1	36.7	.474	.472	.460	.462	15.20	17.43	15.32	16.81
Paper and printing	37.9	38.1	37.4	37.7	.768	.764	.759	.760	27.89	28.04	27.40	27.48
Chemicals and petroleum refining	38.2	38.5	37.3	38.1	.742	.770	.742	.763	28.47	29.61	27.51	29.04
Rubber products	36.0	36.9	28.3	33.9	.760	.771	.773	.760	27.28	28.44	21.07	25.39
NON-MANUFACTURING												
Coal Mining:												
Anthracite	30.9	23.8	26.5	18.6	.920	.933	.931	.908	28.20	22.96	24.86	17.35
Bituminous	27.4	27.7	23.7	23.6	.892	.894	.871	.886	24.35	24.96	20.59	21.38
Metalliferous mining	39.9	39.3	40.9	39.5	.699	.695	.673	.677	27.38	27.06	27.48	26.62
Quarrying and non-metallic mining	33.4	40.6	35.0	43.4	.535	.530	.539	.537	19.69	22.38	19.29	22.17
Crude petroleum	38.7	38.5	40.1	40.5	.881	.884	.884	.829	35.01	33.87	34.88	34.11
Telephone and telegraph	38.0	39.2	37.0	38.6	.826	.803	.813	.813	31.09	30.20	30.19	30.25
Electric light, power and gas	39.4	39.0	40.0	40.4	.862	.851	.844	.834	33.87	33.87	33.66	33.54
Wholesale trade	41.5	41.0	42.2	42.3	.711	.710	.686	.700	29.54	29.76	29.08	29.35
Retail trade	42.7	42.8	42.0	42.7	.549	.553	.542	.545	21.55	21.39	21.45	21.38
Hotels (year-round)	46.0	46.0	42.2	47.1	.321	.323	.317	.307	17.32	15.13	14.00	14.64
Building	29.1	33.5	39.4	32.9	.943	.924	.938	.903	27.38	30.91	28.36	29.60

chasing power improved in the areas which had previously been most depressed, but fell off in London and in the centres dependent on light industries and luxury expenditure.

On the outbreak of war, the Government immediately took over the control of a large number of commodities and imposed regulations of prices over a wide field; and legislation was also passed (Price of Goods Act) for the purpose of restricting profiteering. But the fall in the value of sterling raised the cost of imports, and price increases were allowed to compensate for higher costs. The question speedily arose whether the financing of the war was likely to lead to an inflation of prices such as occurred between 1914 and 1917. The chancellor of the exchequer (Sir John Simon) appealed to the trade unions not to ask for wage-advances except in cases of absolute necessity; but the unions were reluctant to tie their hands in the absence of any assurances concerning the financial policy which the Government intended to pursue.

The question of wage-policy, in relation to the measures of price-control and the methods of financing the war, was of crucial importance. Save to the relatively small extent to which war costs can be met by the liquidation of overseas investments, or by new borrowing from abroad, the burden must obviously fall on current production. The expenditure of the Government was estimated in December as amounting to £2,400,000,000 a year, whereas the total national income in 1938 was about £5,700,000,000. Unless this latter total (in terms of goods produced) can be rapidly increased, it is clear that the war cannot be financed without some fall in the general standard of living. It should, however, be possible, in view of the existence of large-scale unemployment, to increase output considerably, given proper organization; and it is highly unsatisfactory that up to the end of 1939 there was no fall of unemployment even to the pre-war level.

In view of the impossibility of financing the war without inflation unless taxation is very greatly increased, various plans were put forward for a levy on wages as well as on higher incomes. The most important is the plan advanced by J. M. Keynes, under which a proportion of all incomes beyond a certain low minimum (graduated according to the number of dependents) would be paid to the Government, the levy being used in the first place in

payment of taxes, and the balance credited to the account of the payer in the post office savings bank.

Wagner Act: see LABOUR UNIONS; LAW (CASE): Labour.

Wagner Health Bill: see SOCIALIZED MEDICINE.

Wake Island, a possession of the United States of America, since 1899, lies in mid-Pacific in lat. 19° 15' N., long. 166° 38' E. It is about 2,004 miles W. of Honolulu, Hawaii and 1,334 miles N.E. of Port Apra, Island of Guam. It has no native or permanent inhabitants and is a typical coral atoll of three small islets enclosing a shallow lagoon; total land area about 2,600 acres, much of which is from ten to fifteen feet above sea level. Wake Island is under the jurisdiction of the Navy Department which has granted Pan-American Airways permission to establish a temporary air base on Wake Island in connection with transpacific flights. (L. S. F.)

Wales: see GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Walsh, Frank Patrick (1864-1939), American labour lawyer, was born on July 20 in St. Louis and attended St. Patrick's academy there before starting to work as a telegraph messenger. He studied shorthand and law at night, became a court reporter, and was admitted to the Missouri bar in 1889. Soon he became a prominent trial lawyer. After President Wilson took office in 1913 he appointed Walsh chairman of the Federal Commission on Industrial Relations. In 1918 Wilson appointed him and former President Taft joint chairmen of the War Labor Conference Board. He was counsel for individuals and unions in many prominent trials, including the Sacco-Vanzetti case. For 20 years he acted as defence attorney without pay for Tom Mooney. Walsh died in New York city on May 2.

War: see AIR FORCES; ARMIES OF THE WORLD; CHEMICAL WARFARE; EUROPEAN WAR; MUNITIONS OF WAR; STRATEGY OF THE EUROPEAN WAR; SUBMARINE WARFARE; TACTICS IN THE EUROPEAN WAR; ETC.

War Against Hitler: see EUROPEAN WAR.

War Debts. At the end of the World War (1914-18) the United States had acquired obligations of 20

Money Wages—Index Numbers
(1929=100)

	1932	1937	1938	1939
Great Britain (weekly rates)	96	104	107	107 (June)
France, men (daily rates)	103	—	—	—
" (hourly rates)	104	155	167	—
Germany (weekly earnings)	67	81	85	—
" (hourly rates)	82	79	80	80 (March)
U. S. A. (weekly earnings)	60	95	86	94 (June)
" (hourly earnings)	84	117	121	122 (June)
Japan (daily earnings)	85	93	102	114 (March)
Italy (hourly earnings)	91	101	108	110 (March)
Sweden (weekly earnings)	95	103	108	—
" (hourly earnings)	101	103	109	—
Denmark (hourly earnings)	102	105	111	—
Holland, men (hourly earnings)	93	82	86	—
Belgium (hourly earnings)	92	99	105	106 (March)
Canada (hourly rates)	91	98	102	—
Australia, men (weekly rates)	84	88	93	—
New Zealand, men (weekly rates)	85	102	106	108 (March)
S. Africa, men (weekly rates)	93	100	101	—
U. S. S. R. (daily wages)	159	331	—	—
" (monthly wages)	150	315	—	—

Real Wages—Index Numbers
(1929=100)

	1932	1937	1938	1939
Great Britain (weekly rates)	110	110	113	115 (June)
France, men (daily rates)	108	—	—	—
" (hourly rates)	109	141	133	—
Germany (weekly earnings)	85	99	104	—
" (hourly rates)	104	98	97	97 (March)
U. S. A. (weekly earnings)	77	107	99	111 (June)
" (hourly earnings)	108	133	140	144 (June)
Japan (daily earnings) (1932=100)	100	93	95	103 (March)
Italy (hourly earnings)	110	111	110	111 (March)
Sweden (weekly earnings)	103	108	111	—
" (hourly earnings)	110	108	112	—
Denmark (hourly earnings)	114	102	105	—
Holland, men (hourly earnings)	111	101	104	—
Belgium (hourly earnings)	111	108	112	114 (March)
Canada (hourly rates)	111	118	121	—
Australia, men (weekly rates)	104	103	106	—
New Zealand, men (weekly rates)	102	111	112	112 (March)
S. Africa, men (weekly rates)	104	110	107	—

Indebtedness of Nations to U.S.A., June 30, 1939

Country	Principal	Interest Unpaid	Total Indebtedness
Funded debts:			
Belgium	\$ 400,680,000.00	\$ 52,644,480.11	\$ 453,324,480.11
Czecho-Slovakia	165,241,108.00	520,935.00	165,762,043.80
Estonia	10,466,012.87	4,563,427.15	21,029,440.02
Finland	8,119,331.70	113,825.86	8,233,157.56
France	3,863,650,000.00	316,978,819.88	4,180,628,819.88
Germany (Austrian indebtedness)*	25,080,480.66	31,101.43	26,011,672.09
Great Britain	4,368,000,000.00	1,129,069,379.48	5,497,069,379.48
Greece	31,516,000.00	2,779,067.22	34,295,067.22
Hungary	1,908,560.00	480,170.08	2,388,730.08
Italy	2,004,000,000.00	19,250,441.19	2,024,150,441.19
Latvia	6,870,464.20	1,788,901.73	8,668,365.93
Lithuania	6,197,682.00	1,562,926.08	7,760,608.08
Poland	209,057,000.00	57,109,308.70	266,166,308.70
Rumania	63,860,560.43	138,016.24	63,999,476.67
Yugoslavia	61,625,000.00	154,062.52	61,779,062.52
Total	\$11,231,081,200.76	\$1,587,186,843.57	\$12,818,268,044.33
Unfunded debts:			
Armenia	11,959,917.49	11,843,186.62	23,803,104.11
Nicaragua†	—	197,697,551.34	302,298,848.71
Russia	192,601,297.37	—	192,601,297.37
Total	\$ 224,561,214.86	\$ 209,540,737.96	\$ 434,101,952.82
Grand total	\$11,455,642,415.62	\$1,796,727,581.53	\$13,252,369,997.15

* Represents Austrian indebtedness to the United States now charged to the German Government.

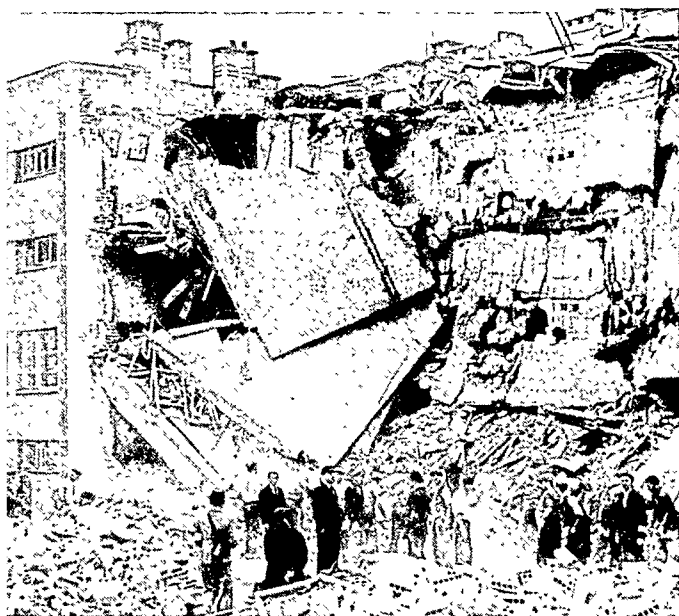
† The United States holds obligations in the principal amount of \$250,898,788, which, together with accrued interest thereon, are to be cancelled pursuant to agreement of April 14, 1938, between the United States and the Republic of Nicaragua, ratified by the United States Senate on June 13, 1938.

nations in the principal amount of \$10,338,312,074.70. Additional obligations amounting to \$12,167,000 were acquired from Greece in 1929. Funding agreements with 13 countries were reached during the years between 1923 and 1926; an agreement with Greece was made in 1929, and an agreement with Austria in 1930, setting their debt with interest to the respective funding dates at \$11,577,260,885 generally payable with interest charges over a period of 62 years. Of the others Cuba and Liberia paid their debt in full, and no agreements were ever reached with Armenia, Nicaragua and Russia. (E. S. D.)

War Propaganda: see PROPAGANDA.

Warsaw. Province and capital city of Poland until Sept. 1939; population (census 1931), 1,171,900; estimate, Sept. 1, 1939, 1,300,000; Poles about 950,000, Jews 350,000.

History.—Until the outbreak of the war, on Sept. 1, 1939, Warsaw was the political, commercial and financial centre of Poland. Since the resurrection of Polish independence, in 1919, a great centralization of power has taken place, and the capital city, in consequence, doubled its population in the last 20 years. From Sept. 1 to Sept. 27, 1939, when the city surrendered to Germany, it was subjected to constant bombardment from the air, and more than one-third of the buildings were either destroyed or



APARTMENT BUILDING IN WARSAW bombed early in Sept. 1939

badly damaged. The city, under the leadership of its mayor, S. Starzynski (q.v.), put up a stubborn resistance against overwhelming odds, and was the last Polish stronghold to surrender. Since the German occupation of the city, thousands of Poles and Jews, driven from smaller communities and from the Western part of the country, have come to Warsaw. On the other hand, many of the old inhabitants escaped into the Russian-occupied section of Poland. Warsaw is (Jan. 1, 1940) a part of the Gouvernement General of Poland, of which Cracow was made the capital. (S. SL.)

Washington, a State in the extreme North-west United States, popularly known as "The Evergreen State." Area, 66,836 sq.mi.; tidal shore line, 1,721mi.; population (U.S. census 1930) 1,563,396; estimate (July 1, 1938) 1,658,000. Capital, Olympia, 11,733; three largest cities (1939 estimates): Seattle, 406,543; Spokane, 135,000; Tacoma, 111,000. In 1930

the urban population was 884,539 or 56.6%. Native born whites dominate population percentages with 81.7%; of the 244,256 foreign born whites, Canada, Sweden, Norway, Germany and England furnished one-half. Negroes numbered 6,840; Japanese, 17,837; Chinese, 2,195; Filipinos, 3,480; Indians (Jan. 1938), 13,741.

History.—Washington celebrated its 50th anniversary of Statehood in 1939. The State legislature, preponderately Democratic and conservative, met in its 26th session from January 9 to March 9. To meet the serious problem of finance, former exemptions from the sales tax of such items as fruit and fresh vegetables, dairy products and unsweetened bread, as well as of commodities purchased with relief vouchers were removed. At the same time the forty-mill limit bill as regards property taxes was placed upon the 1940 ballot as a legislative referendum measure, saving proponents of such limitations the effort and expense of an initiative petition. A general law as regards fair trade practices, as well as acts dealing with such problems in particular industries as apple growing and live stock, were passed. Ratification was extended to the Federal law of May 27, 1937, to prevent speculation in lands in the Columbia basin. Since the Supreme Court sustained its position as to eligibility of persons for old age assistance regardless of need, the legislature modified the State law and also barred such claims against the State based upon the old law. A commission to prepare for the Pacific Northwest Centennial Exposition, scheduled for Seattle in 1942, was created.

Records for continuous pouring of concrete were established at Grand Coulee. Clearing of the area to be covered by the reservoir behind the dam and the moving of towns to higher ground are proceeding rapidly. Of two important new bridges, one will cross Tacoma Narrows of Puget sound, the other, a concrete pontoon structure, will span Lake Washington.

The chief State officers are: Clarence D. Martin, governor; Victor A. Meyers, lieutenant-governor; Mrs. Belle Reeves, secretary of State; Cliff Yelle, State auditor; Phil H. Gallagher, State treasurer; G. W. Hamilton, attorney general; A. C. Martin, commissioner of public lands; William A. Sullivan, insurance commissioner; Stanley F. Atwood, superintendent of public instruction; John Sylvester, speaker of the assembly (26th, 1939).

Education.—The system of higher education includes a university, a State college and three colleges of education. During the school year 1938-39, average daily attendance in elementary and secondary schools was 280,613, the number of teachers employed therein 10,682. Total instructional cost was \$29,629,630.26 and such cost per pupil in daily attendance \$105.58. Salaries of teachers, exclusive of superintendents, averaged \$1,645.56.

Banking and Finance.—Revenues and expenditures for the year ending Dec. 31, 1939 represented an increase over previous years. Gross revenues amounted to \$94,024,648.67; the cash balance as of Dec. 31, 1938 was \$8,414,124.48. The gas tax contributed \$17,227,312.99, and the sales tax \$26,888,963.55. As total disbursements amounted to \$92,889,001.18, the cash balance on Dec. 31, 1939 was \$9,549,771.97. The bonded debt is \$12,111,000. One hundred and forty-four banks in the State reported total capital of \$26,829,000; capital, surpluses and undivided profits of \$54,557,000; deposits of \$568,701,000; resources of \$626,405,000.

Agriculture, Manufactures and Mineral Production.—Statistics as regards agriculture reflect, not merely capricious prices and curtailed markets, but slight tendencies toward shifting of

Leading crops	Value 1938	Av. Prod. 1928-37	Prod. 1938	Prod. 1939 (est.)
Wheat	\$23,755,780	43,729,000 bu.	51,643,000 bu.	39,678,000 bu.
Apples (commercial crop)	20,160,000	24,907,000 bu.	22,400,000 bu.	19,500,000 bu.
Hay (wild and tame)	14,750,900	1,658,000 tons	1,740,000 tons	1,866,000 tons
Potatoes	5,297,600	8,422,000 bu.	7,580,000 bu.	7,568,000 bu.
Pears	2,925,000	4,501,000 bu.	6,500,000 bu.	5,779,000 bu.
Oats	2,283,100	7,870,000 bu.	6,715,000 bu.	9,702,000 bu.

crops. Canning, particularly of prunes, has made definite strides.

The second largest wealth producer, timber, in which Washington outranks all States, has found wood-pulp for rayon an outlet in addition to saw lumber, shingles, veneer and plywood. Salmon and halibut remain the basis of the production of sea-foods, in which the State is also first. To preserve this important industry steps have been taken to safeguard the supply of salmon in the Columbia river basin both from excessive exploitation and from any injury which might result from the construction of the Coulee dam. Attributable largely to capital investments in equipment for reducing the lower grade ores is the remarkable increase in the mineral output, particularly of precious metals. The 1938 record exceeded that of 1937, to then an all-time high. Copper mining is making further progress. The State has 18% of the nation's potential water power. During 1935, 2,865 manufacturing concerns produced goods valued at \$478,385,098. (H. J. DE.)

Washington, District of Columbia, U.S., during 1939 continued to be the fastest growing city in the nation, and more than once rated second or third in monthly building permits, although it is 14th in size among the cities of the United States. The improvements in the Federal city in 1939 were made possible by a series of legislative and administrative acts during the past 150 years.

The National Capital Park and Planning Commission during 1939 made a land survey on which will be based a re-zoning of the city, authorized in 1938, which will reflect so far as possible the social needs of the population. The Navy department which is housed in a temporary building erected during the World War within the Mall will ultimately move to a new Navy building, to be built on the eminence overlooking the Potomac near the site of the Naval hospital which will be moved to the new Naval hospital in course of construction, near Bethesda, Md., all in accordance with approved plans.

A site has been selected for a permanent War department building and funds for the first unit have been made available. In south-west Washington, south of the Mall there were under construction buildings for the Social Security board, the Railroad Retirement board and a general office to house the Census work. The Apex building in the Triangle and the Annex to the Congressional library have been completed and occupied. The murals of the Canterbury Pilgrims in the latter building will be completed in 1940. The exterior of the beautiful Mellon Art gallery will be completed early in 1940. The Thomas Jefferson memorial is under construction in accordance with a plan for location developed and approved by the Planning Commission, altering materially, and removing practical objections to, the original plan.

Park progress under the Planning Commission during 1939 included a new span at the Virginia end of the Key bridge, a re-designed plaza at Rosslyn which will permit the opening of a section of the George Washington Memorial parkway from Key bridge to Memorial bridge in 1940. Montgomery county, Md., gave \$150,000, matched by a like amount from the Federal Government, to provide the first county unit on the Maryland Federal parkway to Great Falls. The signing of an agreement with the Maryland National Capital Park and Planning Commission for the extension of Anacostia park and parkway into Prince Georges county, Md., will result in the acquisition of 500ac. of park land between the District of Columbia and Bladensburg. This will ultimately provide an approach to Washington via the proposed Baltimore-Washington parkway. A Sports Center has been planned at the Anacostia end of East Capitol street and an initial appropriation of \$2,700,000 has been made for a National Guard armory on this site. A stadium will next be undertaken, and grading in Dec. 1939 outlined the plaza approach and the embankment

overlooking the 30-ac. sports field and parade ground.

The Washington National Airport, on the Gravelly Point site recommended by the Planning Commission in 1927, was under construction during 1939 by the Civil Aeronautics Authority. With the relocation of the Mount Vernon Memorial highway and the provision of new approach roads Washington will have one of the most commodious and convenient airports adjacent to any American city.

The Alley Dwelling Authority program for 1939 included plans to erect about 3,000 dwellings on ten sites, five in down-town slum areas, one in a shack community, and four on vacant land, financed by loans of more than \$10,000,000 from the U.S. Housing Authority. Applications were filed during the year for loans of \$3,000,000 more for housing projects on three other sites. The 1939 projects were part of a long-term program that would extend over many years, designed to reclaim all slum areas in the nation's capital and at the same time assure an adequate supply of decent dwellings for all that part of the population not adequately served by private enterprise. (H. Js.)

Water Power. Total increase of the reported installed capacity of water wheels during 1939: 1,134,750 horsepower. Total capacity Jan. 1, 1939, about 65,000,000 h.p., therefore capacity Jan. 1, 1940 about 66,000,000 horsepower. Water power plants and capacities in different countries are reported as completed in 1939 or under construction at the end of the year as follows:

Argentina: On Tercero river at Almafuerde, Cordoba, 18,000 h.p., to be completed in 1941; on Arroyo Cobunco at Chos Mahal, Neuquen, 87 h.p., to be completed in 1940.

Australia: On Kiewa river near Tawonga, Victoria, 32,000 h.p.; on Mossman river near Mossman, 240 h.p.; extension of 2,000 h.p. to plant at Barron Falls near Cairns, North Queensland.

Bolivia: On Hankahuma river 50mi. from La Paz, 2,500 h.p.; on Miquilla river 80mi. from Eucalyptus, 3,500 horsepower.

Brazil: On Salso river at Cacapava, Rio Grande do Sul, 125 h.p.; on Ponto river at Ijuí, Rio Grande do Sul, 750 h.p.; on Prata river at Prata, Rio Grande do Sul, 150 h.p.; on Varro-Sai river at Itaperuna, Rio de Janeiro, 65 h.p.; on Lages river at Sao Joao Marcos, Rio de Janeiro, 47,000 h.p., to be completed in 1940; on Cadeia at Sao Leopoldo, Rio Grande do Sul, 1,000 h.p.; on Macabu river at Macao, Rio de Janeiro, 5,000 h.p., to be completed in 1942; on Batateira at Crato, Ceara, 170 h.p.; on Pirapama river at Escada, Pernambuco, 300 h.p.; on Jacupe-Mirun river at Aqua Prata, Pernambuco, 300 h.p.; on Santa Branca river at Nova Iguaçu, Rio de Janeiro, 900 h.p.; on Piracicaba river at Antonio Dies Abeixo, Minas Geraes, 2,600 horsepower.

Canada: The increase in installed capacity, 98,440 h.p., makes the total for the country 8,289,000 horsepower. The greater part of the increase consisted of extensions of existing plants, 87,000 horsepower. New plants completed: On Charlot river at Wellington lake, Sask., 3,300 h.p.; on Duck river at North Wind lake, Ont., 2,000 h.p.; on Black river near Heron bay, Ont., 1,500 h.p.; on Catarqui river at Brewers Mills, Ont., 999 h.p.; on La Sarre river near La Sarre, Que., 700 h.p.; on Petite river at Conquer Mills, N.S., 600 h.p.; and on Barrie brook near Mulgrave, N.S., 500 horsepower.

Ceylon: None in 1939, start of war caused temporary discontinuance of a 33,500 h.p. plant.

Chile: On Mapocho river about 25mi. from Santiago, 2,400 horsepower.

China: Three water power projects under consideration and construction total 134,000 horsepower.

Chosen: An extensive program of water power development is in progress in connection with industrial and irrigation activities. In North Heian province, seven plants with total ultimate capacities of 2,200,000 h.p.; in Keiki and Kogen provinces, three plants with total ultimate capacities of 625,000 h.p.; in North Zeara province, three plants with total capacities of 90,000 horsepower.

Ecuador: On Ambi river at Ibarra, Imbabura, 450 h.p.; on San Pedro river at La Estela, Pichincha, 7,500 h.p., scheduled for completion in 1939 but work suspended for lack of balance of German-made power installation; on Money river at Cuenca, Azuay, 475 h.p. additional; on Pisque river at Tabacundo, Pichincha, 62 h.p., to be completed in 1940; on Pilalo river at Macuchi, Cotopaxi, 1,200 h.p., to be completed in 1940.

Eire: On Liffey river at Poulaphuca, 20mi. from Dublin, 47,000 h.p., to be completed in 1941.

Finland: Five plants, 162,300 h.p.; 1940-41 two plants 173,500 horsepower.

Guatemala: On Michatoya river near Escuintla, 3,300 horsepower.

Iceland: On Laxaa river near Akureyri 2,000 horsepower.

Japan: Twenty-five plants, 160,000 horsepower. To be completed 1940 to 1943, 13 plants, 69,000 horsepower. Date of completion not reported, 11 plants, 225,000 horsepower.

Latvia: On Daugava river at Kecums 47,000 h.p.; extension of 23,500 h.p., to be completed in 1940.

Newfoundland: On Exploits river at Grand Falls, 35,000 h.p. additional; on Waterfall brook at St. Lawrence, 500 horsepower.

New Zealand: On Rakaia river at High Bank, South Island, 33,000 h.p., to be completed in 1941; on Cobb river near Mount Cobb, 12,000 h.p., date of completion not reported; on Waikaretakeke river near Waikaremoana, North Island, 27,000 h.p. additional, 54,000 h.p., to be completed in 1941; on Waikato river at Arapuni, North Island, 56,000 h.p., to be completed in 1941; Waitaki river near Kurow, South Island, 40,000 h.p., to be completed in 1940.

Norway: Eight new plants (30,200 h.p., includes 10,000 h.p. reported in 1938 as completed but not finished until 1939); extension of 80,050 h.p. at 11 plants (includes 12,000 h.p. reported completed in 1938 but not finished until 1939); 35,000 h.p. at new plants to be completed in 1940 and 1941; extension of 14,400 h.p. at six plants to be completed in 1940.

Peru: On Chili river at Charcani, Arequipa, 5,000 h.p.; on Chicama river at Usquil, Trujillo, 40 h.p.; on Mautaro river at Jauja, 217 h.p.; on Cañete river at Jachahita, Lunahuana, 75 h.p.; on Huallaga river at Huanuco, 500 h.p., to be completed in 1940; on Concepcion river at Aracucho, 150 h.p.; on Cajas river at Tayabamba, Trujillo, 40 horsepower.

Sweden: Six plants, 83,000 h.p.; six plants, 280,000 h.p., to be completed 1940-42.

Switzerland: Two plants, 140,300 h.p., scheduled for completion in 1940.

Tasmania: On Nive river at Tarraleah project, extension of 42,000 h.p., to be completed 1942-43; on Ouse river, 12mi. south of Great Lake, extension of 32,000 h.p., completion in 1942-43.

United States: The increase of 393,000 h.p. in completed power plants is divided between new plants, 173,000 h.p. and additional units on Colorado river at Boulder dam, 220,000 h.p., making this plant the largest in the world, with 1,057,000 horsepower. The larger new plants are on Tennessee river at Guntersville, Ky., 102,000 h.p.; on North Platte river at Seminole dam, Neb., 43,400 h.p.; on Penobscot river at Mattaseunk, Me., 12,800 h.p.; on Kennebec river at Solon, Me., 10,700 horsepower. The following plants were under construction: Big Thompson development, Colo., two plants 29,000 h.p.; ultimate capacity 6 plants, 190,000 h.p.; on Missouri river, Fort Peck, Mont., 500,000 h.p.; on Rio Grande river, N.M., 32,500 h.p.; on Brazos river, Tex., 34,000 h.p.; on Colorado river (of Texas) at Marshall Ford, Tex., 50,000 h.p.; at Austin, Tex., 15,000 h.p.; on Colorado river near Parker, Calif., 121,000 h.p.; on Minidoka river, Idaho, 6,700 h.p.; on Tennessee river at Gilbertsville, Ky., 220,000 h.p.; at Hiwassee dam, N.C., 80,000 h.p.; at Chickamauga, Tenn., 108,000 h.p.; at Pickwick Landing, Tenn., 96,000 h.p.; at Watts Bar, Tenn., 126,000 h.p.; Santee-Cooper development, South Carolina, 213,500 h.p.; on Saluda river near Chappells, S.C., 22,200 h.p.; on Neosho river at Pensacola, Okla., 80,000 h.p.; on North Platte river near Brady, Neb., 24,000 h.p.; near Lexington, Neb., two plants, 72,000 h.p.; on Rio Grande at Elephant Butte dam, N.M., 34,500 h.p.; on Columbia river at Bonneville dam, Ore., 148,000 h.p.; Central Valley project, Sacramento river, 407,000 h.p.; on Columbia river at Grand Coulee dam, 460,000 horsepower. The total capacity of water power plants of 100 h.p. or more in the United States at the end of 1939 was about 18,340,000 horsepower. (See also TENNESSEE VALLEY AUTHORITY.)

The following countries report no water power plants constructed during 1939: British Guiana, British Honduras, Costa Rica, Cuba, Dominican Republic, Estonia, French Indo-China, Great Britain, Greece, Haiti, Honduras, Iran, Iraq, Morocco, Nicaragua, Rumania, Syria, The Netherlands, Tunisia, Turkey.

No reports have been received from the following countries: Belgium, Bulgaria, Denmark, France, Germany, Hungary, Italy, Madagascar, Manchoukuo, Mexico, Poland, Uruguay, Union of Soviet Socialist Republics. (See also DAMS; ELECTRIC LIGHTING; ELECTRIC TRANSMISSION AND DISTRIBUTION.) (N. C. G.)

Watts Bar Dam: see TENNESSEE VALLEY AUTHORITY.

Wealth and Income, Distribution of.

Official Government estimates of the size distribution of the total income in the United States and of the expenditures of income by consumers appeared for the first time when the National Resources Committee published a report in 1938 entitled "Consumer Incomes in The United States" and another in 1939 entitled "Consumer Expenditure in The United States." These figures, showing the number of families or consuming units receiving incomes of varying amounts and making expenditures for different purposes, are based largely on a survey of approximately 300,000 American families in a year covering part of 1935 and part of 1936. Although admittedly subject to considerable limitation, the estimates have been generally accepted as the best yet prepared. The income concept used by the National Resources Committee includes income from personal efforts, income derived from the ownership of property, direct and work relief, and gifts used for current living expenses. Gains and losses from sale of capital assets, except those both bought and sold within the year studied, in-

heritances not used for living expenses, soldiers' bonus payments and borrowed funds were not included as income. Expenditures were classified into approximately 15 categories of commodities, services, and savings.

According to the National Resources Committee study, half of the families and single individuals in the United States in 1935-36 had incomes below \$1,070. The half whose incomes exceeded \$1,070 received 79% of the total income and the other half received 21%. The highest 5%, with incomes of \$3,400 or over, received 27% of the aggregate income, which is approximately the same amount as that received by the lowest 60%, with incomes of \$1,275 or less. Further evidence of the degree of inequality in the distribution of income is revealed in the table on the next page, which shows the percentages of consuming units receiving less than specified amounts of income, and their proportion of the total income.

This table also includes the estimates for 1929 of the Brookings Institution, and the estimates for 1910 of Willford I. King. It should be noted that the nature of the source material, the concepts of income, and the methods of estimation differ somewhat for each of the three estimates of income distribution and as a result their comparability is seriously impaired. Particularly important is the inclusion of realized gains and losses from the sale of securities and of other capital assets in the Brookings estimates for 1929, and the exclusion of this item in the National Resources Committee figures.

The available information hardly permits conclusions concerning the long-time trends in the distribution of income. In making comparisons between the three sets of estimates shown in the table, it is important to give consideration to many qualifying factors. The size of the total income should be considered in studying the distributions. Total family income was estimated by King to be slightly in excess of \$30,000,000,000 in 1910; the Brookings total estimate was above \$90,000,000,000 for 1929; and the 1935-36 estimate of the National Resources Committee was approximately \$60,000,000,000. Living costs were nearly one-fifth lower in 1935-36 than in 1929, and perhaps 40% lower in 1910 than in 1929. Also, a larger portion of the population lived on farms in 1910 than in 1929 and 1935-36.

Uses of Income.—There are marked differences in expenditure patterns of families in different income levels, according to the National Resources Committee report entitled "Consumer Expenditure in The United States." For the lower two-thirds of all income recipients in the United States in 1935-36, aggregate consumer expenditures and personal taxes were in excess of their incomes, the balance having been met from accumulated savings, loans, store credit, or other forms of borrowing. On the other hand, the upper third of families and single individuals, where incomes ranged upwards from \$1,450 for the year 1935-36, saved 19% of their income after all consumption expenditures and outlays for gifts and taxes. The highest one-tenth of income recipients saved about 30% of their income, whereas the lowest one-tenth of consuming units, whose incomes were under \$340 for the year, reported outlays for current consumption half again as large as their aggregate income.

Of all disbursements for consumption items in 1935-36, the lower income third of the nation's consumer units accounted for only 14.4% as compared with 27.7% for the middle third and 57.9% for the upper third. The upper third accounted for 71% of all consumer expenditures for recreation, 75% of all consumer outlays for automobiles and 77% of all disbursements by consumers for education. About 43% of the consumption expenditures of the lower third of income recipients was spent for food, nearly one-third for shelter, and nearly 9% for clothing. Of the consumptive expenditures of the upper third income class, these

three items absorbed slightly under 30%, approximately one-third, and 11%, respectively.

Income Distribution by Type of Payment.—The flow of income can also be analyzed by type of payment. Estimates of income paid out, representing payments by business enterprises to individuals for services rendered in the form of labour, management, capital and land, have been prepared by the Department of Commerce since 1929 and by the National Bureau of Economic Research back to 1919. Generally, the total compensation of all employees accounts for nearly two-thirds of total income paid out, with entrepreneurial withdrawals and return on ownership each accounting for about one-sixth of the total.

Over the past two decades, labour's share of total income paid out has varied only moderately. Entrepreneurial withdrawals have declined relatively as a result of the declining importance of agriculture. The trend toward incorporating of business enterprises effects a shift from entrepreneurial income to dividend and interest income. Interest payments have increased slightly in proportion to total income paid out, while dividends have increased and net rents and royalties have decreased in relative importance. For 1938, the Department of Commerce estimates show the compensation of employees representing 67.3%, dividends and interest 13.0%, entrepreneurial withdrawals 16.1%, and net rents and royalties 3.6% of the aggregate income paid out. These proportions vary substantially from industry to industry. Also, different types of income vary greatly in relative importance at different income levels, with dividends and interest significant in the higher income classes and wages and salaries being predominant in the lower income groups.

Income Distribution By States.—In May 1939 the United States Department of Commerce issued the first official estimates ever developed of the distribution of income among the various States. These figures covered the years 1929 to 1937, inclusive, and included total and per capita incomes and a breakdown by type of income payment for each State. For 1937, the average income per person in the United States was \$547 and the average was higher than this level in 20 States and the District of Columbia. In Delaware, Nevada, New York, California and the District of Columbia, the income per person was more than 50% above the national average. On the other hand, in Mississippi, Arkansas, Alabama and South Carolina, the average income was less than half the national average. Thus in each of the top income States listed above, average incomes were more than four times as large as in the four lowest income States listed. Differences in per capita incomes are not wholly indicative of differences in welfare because of variations in living standards and costs geographically and between different sized communities.

Income fluctuations from year to year varied widely among States. Income payments for the United States were 12% lower in 1937 than in 1929, but in the District of Columbia and seven States, the 1937 income exceeded that of 1929. On the other hand, in six States, income in 1937 was one-sixth or more below 1929. Similar differences appeared in the drop subsequent to 1929 and in the 1932-33 to 1937 recovery period.

Distribution of National Wealth.—No official estimates of the total national wealth or of its distribution have been made since 1926, when the Federal Trade Commission issued a report entitled "National Wealth and Income."

This report, in which the wealth figures were based primarily on the Bureau of the Census wealth estimates, showed a total national wealth in 1922 of \$353,000,000,000, as compared with \$205,000,000,000 in 1912.

As evidence of the distribution of wealth among individuals, the Federal Trade Commission agents gathered data on the values of 43,512 estates of deceased persons in a dozen widely scattered States over the period 1912-23. The size distribution of these estates cannot be accepted as indicative of the size distribution of wealth among all living individuals.

The study showed that 1% of the estates held 59% of the total wealth of the estates analyzed, and more than 90% was accounted for by about 13% of the estates. The data tended to show a declining degree of wealth concentration between 1912 and 1922 and a greater degree of concentration in cities than in towns and rural areas.

Using a variety of data and methods of estimation, Dr. Willford I. King developed estimates of the distribution of wealth among property owners in the United States as of the close of 1921. These estimates appeared in the June 1927 issue of the *Journal of the American Statistical Association*. Approximately half of the 41,000,000 property owners in the United States were estimated as owning less than \$2,500 each, and in the aggregate less than 10% of the national wealth. The 10% who owned more than \$10,000 each, held nearly two-thirds of the total wealth. The highest 2% owned 40% of the total, and the highest 1% owned approximately one-third.

The lack of recent estimates of total wealth and its distribution may be explained by the difficulty of preparing such estimates and the relatively limited use and value of wealth estimates. Many objects of wealth do not change hands at frequent intervals, and it becomes necessary to place arbitrary valuations on such objects. Even where a continuous market exists, the determination of proper valuation is uncertain. In the case of corporations, the book values and the market values of the securities are greatly different and there are arguments in favour of the use of each.

Wealth is primarily important as a source of income and, therefore, income figures largely defeat the need for wealth data. Also, wealth estimates include only the value of existing commodities and take no account of the value of human skills and abilities. With the increase in large corporations and absentee ownership, wealth is not necessarily related to the exercise of business control. It is generally conceded that income figures are of greater significance than statistics on wealth. (See also NATIONAL INCOME.)

(R. R. N.)

Percentages of Consuming Units Receiving Incomes Under Specified Amounts, Their Incomes and Their Outlays.

Income Classes (In dollars)	Family Incomes, 1910 (Willford I. King)		Family Incomes, 1929 (Brookings Institution)		Family Incomes, 1935-36 (National Resources Committee)		Family Outlays, 1935-36 (National Resources Committee)		
	Consuming Units	Income	Consuming Units	Income	Consuming Units	Income	Current Consumption	Gifts and Personal Taxes	Savings
Under 500 . . .	16.70	6.35	10.15	.32	17.01	3.48	5.6	1.4	—13.4
750 . . .	..	..	..	..	31.64	9.58	13.4	5.0	—19.8
1,000 . . .	69.43	42.48	27.48	5.50	46.54	18.23	23.8	10.7	—24.1
1,500 . . .	90.31	65.08	48.82	15.99	68.68	36.27	44.3	23.0	—24.1
2,000 . . .	94.86	72.10	65.26	27.11	81.82	51.25	60.4	35.7	—16.7
2,500 . . .	..	..	75.71	36.26	89.32	62.34	71.7	45.1	—6.9
3,000 . . .	..	..	81.88	42.86	93.06	69.10	78.4	50.8	1.2
3,500 . . .	97.42	77.76	89.27	52.82	96.49	76.86	85.6	58.2	13.6
4,000 . . .	98.39	80.78	92.97	59.28	97.66	80.31	88.6	62.0	20.8
5,000 . . .	..	..	97.95	72.33	99.17	87.22	93.8	70.8	41.2
10,000 . . .	99.54	86.86	99.47	81.00	99.83	93.65	96.8*	78.6*	60.5*
25,000 . . .	..	..	99.79	85.33	99.96	96.61	..	..	..
50,000 . . .	99.94	94.10	99.92	88.76	99.99	98.14	..	..	..
100,000 . . .	99.99	96.70	99.99	93.49	99.99+	99.50	..	..	..
500,000 . . .	..	..	99.99+	95.35	99.99+	99.73	..	..	..
1,000,000 . . .	99.99+	98.30	..	..	..	..	..	..	..

*Under \$20,000 income class. Source does not provide data at \$25,000 income level. The balance between these figures and 100% represents the proportion by outlays for the income classes of \$20,000 and over.

Weather: see METEOROLOGY.

Weber, Herman Carl (1873–1939), U.S. clergyman and editor, was born February 9 at Mina, N.Y., and received his bachelor's and master's degrees at Rutgers university. He also received degrees of divinity at the New Brunswick (N.J.) Theological seminary in 1898 and at Albany (Ore.) college in 1927. He held several Presbyterian pastorates in New York State, and after 1929 directed every membership canvass of the general council of the Presbyterian church in the U.S.A. He was editor of the *Year Book of American Churches* and author of several volumes on the statistics of church membership. He died at East Orange, N.J. on July 25.

Welfare Work: see SOCIAL SERVICE.

Wellesley College in Wellesley, Mass., founded in 1870, is a four-year liberal arts college enrolling approximately 1,500 women. It is pre-eminently for candidates for the B.A. degree, but also offers the degrees of Master of Arts, Master of Science, Master of Arts in Education, and a certificate in hygiene and physical education. At Wellesley there are chapters of Phi Beta Kappa and Sigma XI.

In 1939 there were nearly 13,000 graduates, representing a wide variety of interests. The faculty numbered 201 men and women trained in nearly 100 universities and colleges. The self-perpetuating board of trustees consisted of 24 men and women. The college had trust funds amounting to \$10,129,960.60, and a plant valued at \$11,033,856.30.

Wellesley tradition includes an emphasis on scholarship, intelligent religious interest, constructive citizenship and aesthetic appreciation. (M. H. McA.)

West Africa, British: see BRITISH WEST AFRICA.

Westermarck, Edward Alexander (1862–1939), Finnish sociologist and anthropologist, was born at Helsingfors on November 20 and educated at the Swedish lyceum in that city and at the University of Finland. From 1907 to 1930 he was professor of sociology at the University of London and afterwards emeritus professor of philosophy at the Academy of Abo. Westermarck wrote and lectured extensively on the origin of ethics and the development of marriage as a social institution. His *History of Human Marriage* (1891) was translated into six languages and went through five editions. His most recent works were *Ethical Relativity* (1932), *Early Beliefs and their Social Influence* (1932), *Pagan Survivals in Mohammedan Civilization* (1933), *Three Essays on Sex and Marriage* (1934), *The Future of Marriage in Western Civilization* (1936), and *Christianity and Morals* (1939). For his other writings see *Encyclopædia Britannica*, vol. 23, pp. 524–5. He died at Lapinlahti, Finland, on September 3.

West Indies, an archipelago between Florida and South America, including the Greater Antilles (Cuba, Puerto Rico and Jamaica, with lesser, dependent islands) and the Lesser Antilles; languages, Spanish, English, French and Dutch. The area is approximately 99,000 square miles. The population (estimated at approximately 12,300,000 in 1939) is predominantly white in Cuba and in Puerto Rico, and 80% to 99% negroid elsewhere, except in Trinidad, where around 40% is East Indian. The archipelago includes three republics, two dependencies of the United States and six British, two French and one Netherlands dependency. Trade is chiefly with the United States and, in the European colonies, with their respective metropolises, with im-

ports usually foodstuffs, especially flour, textiles, and manufactured articles. Exports are sugar, principally, and other tropical agricultural products, and, from Trinidad and Curaçao, petroleum products. Resources are almost entirely agricultural, except in Cuba and Hispaniola, which have some undeveloped mineral deposits, and in Trinidad and Curaçao. European war conditions caused serious economic dislocation late in 1939, but gave promise of eventual trade benefit, especially through increased demand for sugar and enhancement of the tourist trade. (See also BAHAMAS; CUBA; CURAÇAO; DOMINICAN REPUBLIC; GUADELOUPE; HAITI; HISPANIC AMERICA AND THE EUROPEAN WAR; MARTINIQUE; PUERTO RICO; VIRGIN ISLANDS; WEST INDIES, BRITISH.)

BIBLIOGRAPHY.—*The West Indies Year Book for 1939* (London, 1939). (L. W. Be.)

West Indies, British. The several British islands in the West Indies; language, English. Politically, the islands are administered separately or in groups as British crown colonies: Jamaica; the Leeward Islands, a loose federation of the presidencies, or colonies, of Antigua, St. Kitts-Nevis, Montserrat, Virgin Islands (British) and Barbados; Trinidad and Tobago; and Grenada, St. Lucia, St. Vincent and Dominica, otherwise separate colonies, but collectively called the Windward Islands and administered under a common governor, who usually resides at St. George's, Grenada. By Act of Parliament of March 30, 1938, the transfer of Dominica from the Leeward Islands administration to that of the Windward Islands was ordered, effective Jan. 1, 1939, but, due to technical details, actual consummation of the transfer has been delayed.

Each colony has a governor or other chief executive appointed by the Crown (for names of governors, see BRITISH EMPIRE), an appointed executive council, and a partially elected legislative council or assembly. Barbados has a representative legislature but not full responsible government, and is the only colony electing a majority of its legislative body, which is the third oldest elected body in the British Empire. On Jan. 26, 1939, Barbados celebrated the tercentenary of the establishment of representative government in the colony. Suffrage and office holding are generally restricted by property qualifications.

Table 1. Areas and Population of British West Indies

Colony	Area (sq. mi.)	Pop.	Capital
Jamaica (including Turks and Caicos and Cayman Is., 306 sq. mi.)	4,846	1,173,645	Kingston (76,986)
Trinidad and Tobago (Trinidad, 1,862 sq. mi.)	1,980	464,889	Port of Spain (75,680)
<i>Windward Islands</i>			
Dominica	305	50,617	Roseau (8,000)
St. Lucia	238	68,085	Castries (9,000)
St. Vincent	150	58,381	Kingstown
Grenada (including Carriacou, 13 sq. mi.)	133	96,291	St. George's (4,629)
<i>Leeward Islands</i>			
Antigua (including Barbuda, 62 sq. mi. and Redonda)	170	34,523	St. John's (10,000)
Barbados	166	193,082	Bridgetown (70,500)
St. Kitts-Nevis (St. Christopher, 68 sq. mi., Nevis, 50 sq. mi., Anguilla, 34 sq. mi.) . . .	152	38,057	Basse-Terre (8,000)
Virgin Islands (British)	67	6,288	Road Town
Montserrat	32	13,712	Plymouth (2,000)
	8,239	2,997,570	

History.—The most important development in British West Indian history during 1939 was the report of the Royal Commission of Inquiry appointed in Nov. 1938 to investigate economic and social conditions. The report, made public in August, deplored unsatisfactory housing and living conditions generally, and urged establishment of part-time workers as peasant proprietors, improvement of housing standards, creation of agricultural aid societies, greater attention to health, and the providing of meals

and milk to undernourished school children. Imminence of war when the report appeared, however, prevented its receiving wide attention in Great Britain. In January, following cessation of a general strike which had paralyzed Jamaica economically, the Jamaica government had promised economic and social reforms, but when it failed to effect them immediately a strike of waterfront workers (in mid February) brought new disturbances and obliged the governor to proclaim a state of emergency for several days.

Outbreak of the European war, in Sept. 1939, had immediate repercussions throughout the British West Indies, as the colonies immediately put themselves on a war footing. Trinidad and Jamaica granted their respective governors emergency powers and imposed press censorship. Price regulation was resorted to in an attempt to hold down the mounting cost of living, a licence system on imports was set up. The licence system was made necessary by the decline of the pound sterling in terms of the dollar, and consequent shortage of exchange.

Despite the various restraints imposed, the first month of war saw heavy price increases, especially in Jamaica, and a retrenchment in that colony's public works program and other governmental activity as a result of rising costs. Nevertheless, the agricultural situation was regarded as satisfactory, especially in Trinidad, where the outlook was for higher agricultural prices for commodities. Trinidadian oil production likewise was high.

In October, a wave of sharp indignation swept the entire British West Indies when a United States Senator formally proposed that the United States seize the British islands as the only means of obtaining repayment of the British debt to the United States.

Communication.—Under normal conditions the West Indies are adequately supplied with communications. Steamship lines from Europe and from the American mainland provide frequent, direct service between the more important islands and the outside. Kingston, Port-of-Spain, and Bridgetown are important ports of call.

Only Jamaica, with 210mi., and Trinidad, with 123mi., have railways. Roads are adequate for local needs. The Pan American Airways system provides regular, frequent air transport service to Kingston, St. John's, Bridgetown and Port-of-Spain, as well as to the principal non-British islands. From these points steamer connections are made to the lesser islands. In 1939 air service from Port-of-Spain was inaugurated to Tobago, and to Barbados.

Commerce and Industry.—Except in Trinidad, where petroleum (19,265,000bbls. in 1939) and asphalt dominate the economic life, and Barbados, where some petroleum deposits exist, the British West Indies lack mineral resources.

Agriculture and the processing of its products (especially sugar) is practically the sole basis of economy except in Trinidad. A wide diversity of agricultural commodities is produced, but sugar, bananas, cocoa and cotton are generally important. Over 200,000ac. are planted in sugar. Under the International Sugar Agreement of 1937, sugar production has been restricted by quota, however, with the entire islands allotted 413,350 long tons (Trinidad and Tobago, 132,200 tons; Barbados, 109,200 tons; Jamaica, 82,400 tons; Leeward Islands, 59,500 tons; Windward Islands, 10,050 tons). Against this allocation, the estimated yield for 1938-39 was 417,550 tons. A large portion of the sugar is processed into rum and molasses.

Approximately 76,022ac. are in bananas, almost entirely in Jamaica (72,909ac.). Export of 23,811,337 stems in 1938 made the island the world's leading banana exporter. Over 88% went to Europe.

An area of 237,014ac. is devoted to cocoa (210,000ac. in Trinidad and Tobago, 20,500ac. in Grenada). World overproduction is a serious obstacle to the industry. Cocoa comprises over half of

Grenada's exports, 7% of Trinidad's.

Approximately 105,375ac. is devoted to coco-nuts, with Trinidad and Tobago leading (52,500ac.), Jamaica second (40,074ac.). Jamaica, however, leads in exports, shipping 33,415,393 out of the 41,000,000 nuts exported by all the islands. St. Lucia, Trinidad and St. Vincent are next in coco-nut export.

In 1938, 21,600ac. were planted in cotton (mostly sea island). Production was 5,165 bales of 400lb. (including 4,440 sea island), with 1,687 bales in Montserrat, 1,100 in St. Vincent.

Coffee, mostly low grade but with some of very high quality, is grown in Jamaica, Trinidad and Dominica. Out of 10,000,000lb. exported in 1938, 94% was from Jamaica.

Citrus fruits (8,970ac.) are grown in Trinidad, Dominica, Jamaica, St. Lucia, Virgin Islands and Antigua.

Jamaica has experienced considerable development since 1933. Dominica, St. Lucia and Trinidad are among the world's chief lime juice producers.

St. Vincent is the world's leading supplier of arrowroot, exporting 8,179lb. in 1938, valued at £91,638 (44% of the export total). Grenada is important for nutmegs, exporting 3,676,512lb. in 1938 (£105,264 value, or 33% of all exports). St. Vincent, Trinidad and St. Lucia are minor producers.

Jamaica, in 1938, exported 1,308 tons of ginger. Some ginger is produced in Dominica, St. Lucia and St. Vincent. Jamaica is virtually the only producer of "allspice," exporting £207,070 value in 1938.

Table II. Imports and Exports of the British West Indies

Colony	Imports		Exports	
	1937	1938	1937	1938
Trinidad and Tobago. . .	\$35,836,000	\$35,497,000	\$33,702,000	\$35,368,000
Jamaica	\$6,485,000	\$4,994,000	\$3,821,000	\$5,033,000
Barbados	\$2,221,000	\$2,087,000	\$1,647,000	\$1,354,000
Grenada	\$381,000	\$304,000	\$401,000	\$315,000
St. Kitts-Nevis	\$284,000	\$302,000	\$387,000	\$266,000
Antigua	\$271,000	\$242,000	\$339,000	\$222,000
St. Vincent	\$203,000	\$199,000	\$187,000	\$211,000
St. Lucia	\$245,000	\$189,000	\$147,000	\$135,000
Dominica	\$125,000	\$103,000	\$73,000	\$78,000
Montserrat	\$64,000	\$59,000	\$61,000	\$38,000
Virgin Islands	\$13,000	\$14,000	\$11,000	\$10,000

Great Britain supplies approximately a third of the imports of Jamaica and Trinidad, 40% of those of Barbados and from 40% to 55% of the Leeward and Windward islands imports, while Canada sends from 12% (Trinidad) to 22% (Grenada), the United States from 12% in Barbados to 14% in the Leeward and Windward islands (less in the smaller ones). Exports to Great Britain range from 35-40% in the Windwards to 60% from the other colonies (5% from Trinidad and Tobago). The United States buys almost a third of St. Vincent's exports, 26% of the Leeward's, 10% of Trinidad's and down to 3% of Jamaica's.

The monetary unit is the pound sterling, except in Trinidad, where it is the Trinidad dollar (approximately equal to the U.S. dollar).

(L. W. BE.; M. L. M.)

West Virginia, sometimes called the "Panhandle State," was formed from Virginia during the Civil War and admitted to the Union, June 20, 1863. It has an area of 24,170 sq.mi. Its population in 1930 was 1,729,205 of which 1,613,934 were whites (51,520 foreign-born). Its total urban population was 491,504. Its population July 1, 1937, was estimated at 1,865,000. Its capital is Charleston (population over 60,408). Its other chief cities are Huntington (75,572) and Wheeling (61,659). It has 3,928mi. of steam railway, 233mi. of electric railway and a new and extensive system of improved highways (over 12,044 miles).

The chief State officers in 1939 were: governor, Homer A. Holt; secretary of State, William S. O'Brien; treasurer, R. E. Talbott; auditor, Edgar B. Sims; attorney-general, Clarence W.

Meadows; commissioner of agriculture, J. B. McLaughlin; superintendent of schools, W. W. Trent.

Education.—Education is free in the public schools for all children between six and 20 years of age and is compulsory for all between seven and 16. The pupil enrolment in the State elementary schools for 1938-39 was 318,286. In the 378 State high schools it was 132,458. The number of teachers was 11,334 in the elementary schools and 4,839 in the high schools. The total State appropriation for elementary and secondary education in 1938-39 was \$14,341,498 (of which the general school fund was \$341,498).

The State supports seven teachers-training colleges which in 1938-39 had a total student enrolment of 3,307 and a total instructional membership of 351, and received State appropriations amounting to \$910,250. It also supports the West Virginia university which in 1938-39 had an enrolment of 3,939, a total faculty membership of 268 (besides 64 assistants and the staffs of the Demonstration School, Library, Experiment Station, Extension, Military and Athletics) and a total income of \$2,428,488.

Banking and Finance.—On July 1, 1939, the total deposits of the 103 State banks and trust companies were \$132,063,704.11. The total deposits of the 78 national banks in the State were \$157,603,000.

The summarized finance statement of the State treasurer for the fiscal year 1938-39 is as follows:

Balance July 1, 1938	(all funds)	\$ 15,957,889.10
Receipts for 1938-39	{ (all funds)	95,734,172.22
	{ (transfers)	43,236,531.93
Total		\$154,928,593.25
Disbursements, 1938-39		
(all funds)	\$100,051,729.93	
(transfers)	43,236,531.93	
		143,288,261.86
Balance, July 30, 1939		\$ 11,640,331.39

On July 1, 1939, the total State funded indebtedness was \$78,612,000; the total amount of outstanding State road bonds was \$75,112,000.

The total assessed value of all property in 1939 was estimated at \$1,813,979,630 (real estate, \$837,104,169; personal property, \$382,419,461; public utilities, \$584,456,000). The Federal income tax in West Virginia for the fiscal year 1938-39 was \$13,585,757 (of which \$7,230,301 was from corporations, \$4,406,583 from individuals).

Industries.—In 1935 the oil production was 3,959,000bbl. (which decreased to 3,847,000bbl. in 1936 and 3,660,000bbl. in 1937). In 1938 it was 3,724,750bbl. and the natural gas production was about 150,000,000,000 cubic feet. In 1937 the coal production was 118,965,066 short tons and the coking operations produced an output of 276,778 tons. In 1935 the State had 1,042 industrial establishments, which employed 77,317 persons and paid \$80,105,045 in wages. These plants had a total production of about \$370,230,129—indicating a considerable decrease since 1929 but well above figures for 1931 and 1933.

Agriculture.—The acreage, production and value of the chief farm crops during 1938 were as follows:

	Acreage	Yield	Value
Corn	477,000	12,640,000 bu.	\$8,722,000
Wheat	156,000	2,340,000 bu.	1,732,000
Oats	86,000	1,806,000 bu.	777,000
Buckwheat	16,000	256,000 bu.	177,000
Hay	684,000	802,000 tons	8,100,000
Apples . . . . .	..	3,227,000 bu.	2,258,000
Potatoes	32,000	2,720,000 bu.	2,176,000

The number of farms by census of 1934 was 104,747 (acreage of 9,424,655).

BIBLIOGRAPHY.—IV. *Va. Bluebook* and various official departmental reports. (J. M. CA.)

West Wall: see SIEGFRIED LINE.

Whaling: see FISHERIES: *Whaling*; NORWAY.

Wheat. The world's supply of wheat for the crop year 1939-40 is the largest on record, approximately 5,464,000,000bu., compared to 5,225,000,000bu. in the previous record year, 1938-39, and a ten-year annual average of 4,719,000,000 bushels. Production in 1939 was about 298,000,000bu. less than the highest producing year, 1938, the year 1939 being second in the volume of production. A huge carry-over from 1938, plus a near-record 1939 crop, accounts for the all-time high in the accumulated supply. Figures herein do not include the two largest wheat producing countries, China first and Russia second. No reliable data on wheat production have been available from China and the U.S.S.R. for several years.

Estimated Wheat Production by Countries, 1936-39
(ooo omitted)

	1936 bu.	1937 bu.	1938 bu.	1939 bu.
World	3,579,000	3,851,000	4,557,000	4,259,000
Europe	1,481,339	1,538,382	1,826,937	1,657,665
North America	859,565	1,066,473	1,294,236	1,108,173
United States	626,766	875,676	930,801	736,115
Canada	219,218	180,210	350,010	449,058
Mexico	13,581	10,587	13,425	13,000*
England & Wales	51,445	52,005	69,253	56,143
Scotland	3,547	4,181	3,883	3,163
Northern Ireland	273	164	213	200*
Eire	7,839	6,990	7,398	7,000*
Norway	2,004	2,497	2,637	1,800*
Sweden	21,635	25,720	30,184	23,000*
Denmark	11,266	13,521	16,902	12,000*
Netherlands	15,428	12,615	15,138	12,000*
Belgium	16,153	15,550	20,056	15,000*
France	254,618	257,837	345,385	276,000
Spain	121,492	110,000	96,000	111,773
Luxemburg	1,071	1,206	1,830	872
Portugal	8,651	14,668	16,534	16,000*
Italy	224,570	296,280	297,317	294,400
Switzerland	4,470	6,184	7,805	5,500*
Germany & Austria	176,609	178,590	221,163	158,000*
Czechoslovakia	55,583	51,266	65,708	55,000*
Greece	19,537	30,049	36,135	35,273
Poland	78,357	70,774	79,802	83,407
Lithuania	8,027	8,109	9,233	8,000*
Latvia	5,272	6,302	7,052	7,000*
Estonia	2,433	2,786	3,139	3,000*
Finland	5,259	7,665	7,973	8,010*
Malta	236	326	296	300*
Albania	1,106	1,636	1,650	1,500*
Bulgaria	60,350	64,909	78,986	71,155
Hungary	87,789	72,157	96,782	112,193
Rumania	128,717	138,157	177,154	176,307
Yugoslavia	107,422	81,238	111,329	103,726
Algeria	29,774	33,208	34,941	44,827
Morocco	12,234	20,895	23,172	38,764
Tunisia	8,083	17,637	13,662	18,555
Egypt	45,700	45,376	45,933	49,016
Palestine	2,795	4,682	1,633	5,000
Syria & Lebanon	15,704	17,227	23,674	22,000*
India	352,203	364,075	501,856	370,668
Japan	45,192	50,410	45,244	54,417
Chosen	8,095	10,323	10,401	12,286
Turkey	141,582	132,985	150,097	150,000*
Argentina	249,193	184,799	336,201	260,000*
Australia	151,390	187,258	154,543	193,000
Union of South Africa	16,077	10,157	17,093	15,000*

*Unofficial estimate.

Although the 1939-40 surplus of wheat was the heaviest of record, prices advanced spectacularly following the invasion of Poland by Germany September 1 and the declaration of war by Britain and France September 3. In the United States and Canada the maximum daily gains allowed by law were repeatedly exceeded and numerous changes governing trade in wheat were made by different Governments.

The Liverpool market was closed. Chicago, Winnipeg and the Argentine markets remained open. The U.S. Department of Agriculture suspended its export subsidy, instituted in August. The food defence department of the United Kingdom requisitioned all wheat stocks, and millers were licensed and authorized to produce straight-run flour of 70% extraction at fixed prices. Australia announced on September 14 the Government would requisition all commercial stocks of wheat and establish a compulsory marketing pool. Argentina on September 6 suspended the minimum

domestic price of 7 pesos per quintal. In Canada, the largest wheat-exporting country, with the 1939 crop being the heaviest since 1928, it was estimated that the available export supply would be 416,000,000bu., including the carry-over of 95,000,000bu. from 1938. The carry-over in the United States July 1, 1939, was 254,286,000bu., compared to 154,072,000bu. July 1, 1938. Export supplies were so large, especially in Canada and Argentina it was not considered likely that all export wheat would be moved the crop year, 1939-40, even under the stimulus of war prices. World disappearance of wheat was 4,025,000,000bu. in the crop year of 1938-39, and 3,810,000,000bu. the preceding year.

Up to the outbreak of war in September virtually all wheat exporting countries were struggling with huge surpluses and low prices, with Governments generally granting subsidies or regulating prices to aid producers. This situation developed from large increases in production in importing countries as well as in exporting countries.

In the 1920s, L. A. Wheeler of the U.S. Department of Agriculture points out, exporting countries normally produced about 750,000,000bu. of wheat for export annually, and importing countries ordinarily took that amount. In recent years, however, the total demand by the importing countries has been about 550,000,000bu. annually, while exporting countries have been producing about 900,000,000bu. for export yearly. England, Germany, and Italy have greatly increased home production of wheat by Government-guaranteed prices to farmers. At the same time consumption of wheat flour has decreased in these countries owing to governmental encouragement of the use of potato, rye, and corn flour as admixtures in wheat flour. Virtually all the smaller wheat importing countries have followed similar policies in increasing home production and decreasing consumption. France, a large producer, maintains a Government monopoly in wheat and fixes prices to encourage production, while discouraging imports with a tariff of about \$1.50 a bushel. (See L. A. Wheeler in *Foreign Agriculture*, U.S. Dept. of Agriculture, Jan. 1939.) (See also CEREALS; FLOUR AND FLOUR MILLING.) (S. O. R.)

Wheeler-Lea Amendment: see ADVERTISING: Legislation; LAW (CASE): Trade Regulations.

Whisky: see LIQUORS, ALCOHOLIC.

White Russian S.S.R.: see UNION OF SOVIET SOCIALIST REPUBLICS.

Whitney Museum of Art: see SCULPTURE.

Wholesale Prices: see PRICES.

Whooping Cough: see SERUM THERAPY.

Wild, Frank (1874-1939), British antarctic explorer, was born at Skelton, Yorkshire, England. At the age of 15 he joined an expedition to Australia. After 1901, when he joined the British National Antarctic expedition under Capt. Robert F. Scott aboard the "Discovery," Wild was a member of practically all important British explorative parties to the antarctic during the next 20 years. In 1908 and 1909 he accompanied Sir Ernest Shackleton in the small whaler "Nimrod," and in 1911-13 he was a member of Sir Douglas Mawson's Australian Antarctic expedition, for which he established and commanded the western base. He sailed with Shackleton again in 1914 with the Imperial Trans-Antarctic expedition aboard the "Endurance." After their ship was crushed and abandoned in Oct. 1915, the party drifted for almost six months on an ice-floe. When the floe broke up, the expedition separated, and Wild commanded 21 men who landed on Elephant island, where they remained under terrible hardships until they were rescued by Shackleton Aug. 30, 1916. Wild was second in command aboard the "Quest" on Shackleton's last expedition, which sailed in Sept. 1921. After

Shackleton's death on South Georgia island Jan. 5, 1922, Wild continued the expedition and obtained important sounding data. Upon his return he established his residence in South Africa. He died August 20, at Johannesburg.

Wild Life Conservation. The Federal Aid to Wild Life Restoration Act (50 Stat. 917), known also as the Pittman-Robertson Act, which became effective on July 1, 1938, seems destined to be of incalculable benefit to wild life. The act authorized operating appropriations of not to exceed the annual revenue from the 10% tax on sporting arms and ammunition. Collections from this tax for the fiscal year 1939, as far as figures are available, totalled \$2,976,019. Federal funds thus made available are apportioned to the States, under certain other conditions, on the basis of land area and hunting licences sold, and each State must contribute 25% of the cost of acquisition and development of land and water areas for wild life purposes and for research in the problems of management. All lands purchased are owned by the States and are to be maintained by them. The act requires the States to submit full information regarding their proposed wild life-restoration projects and, following approval by the Chief of the Bureau of Biological Survey, acting for the Secretary of the Interior¹, to complete them in an acceptable manner.

The initial appropriation to the Biological Survey was \$1,000,000; and for the fiscal year 1940 \$1,500,000 was appropriated. At

¹The Bureau of Biological Survey was transferred from the U.S. Department of Agriculture to the Department of the Interior, effective July 1, 1939, in accordance with the President's Reorganization Plan No. II, pursuant to the Reorganization Act of 1939.

HUNDREDS OF CROWS were shot in Feb. 1939 to provide the main course for a game conservation dinner in Grand Rapids, Michigan



the close of 1939 43 States had become eligible for participation, 42 of which submitted 187 projects. The types of projects were as varied as the problems of the State game departments, 72 involving research in wild life management, 71, development of natural conditions and 44, the acquisition of lands by purchase or lease.

Waterfowl Hunting Regulations.—Reductions in numbers of waterfowl, due to over-killing, drought and the general destruction of suitable habitat, threatened the extermination of certain species of ducks, and led four years ago to the adoption of stringent regulations, including the shortening of the open season to 30 days.

Curtailed annual kills, improved conditions on the northern breeding grounds, and the Federal refuge program were, however, believed to be responsible for an apparent increase, warranting a lengthening of the 1938 open season to 45 days.

Similar regulations were extended to the 1939 open season. The new regulations became effective when approved by the President on recommendation by the Secretary of the Interior.

Big-Game Preserves and Ranges.—Two new big-game ranges of outstanding importance, both in Arizona, were established by Executive order during 1939.

These are the Cabeza Prieta Game Range of 860,000ac., and the Kofa Game Refuge of 660,000ac., which are being administered by the Biological Survey in co-operation with the Grazing Service of the Department of the Interior. They were established primarily to protect the Gaillard bighorn sheep, but other species also receiving protection are the antelope, peccary, mule deer and Gambel's quail. (See also BIOLOGICAL SURVEY, U.S. BUREAU OF; BIRD REFUGES.) (E. A. G.)

Williams, Mrs. G. A. R.: see HEATH, LADY MARY.

Wilson, Clarence True (1872–1939), U.S. clergyman and prohibitionist, was born in Milton, Del. on April 24. He received his bachelor's degree from the University of Southern California in 1894, and continued his education at McClay college of theology, Los Angeles, San Joaquin Valley college, and St. John's college, Annapolis, Md., at each of which he received a degree. He first served as a Methodist minister at Seaford, Del., from 1889–91; later he occupied pulpits at Sea Cliff, L.I., Pasadena, San Diego, Newark and Portland. From 1910 until his death he was general secretary of the Methodist Board of Temperance, Prohibition and Public Morals. An ardent opponent of the sale and consumption of liquor, he also began a campaign in 1919 to prohibit the distribution of cigarettes to U.S. soldiers. He died at Portland, Ore., on February 16.

Wilson, Harry Leon (1867–1939), American author best known for his characters "Ma Pettengill" and "Ruggles of Red Gap," was born at Oregon, Ill., on May 1. He left school as a youth "to live his own life" and wandered to California, where he was occupied in miscellaneous jobs before he began contributing to the weekly *Puck*. In 1892 he was invited to become associate editor of this publication, and from 1896 to 1902 he was its editor. His first book, *Zig Zag Tales* (1896), was an indifferent success, but his second, *The Spenders* (1902) enabled him to resign his editorial position and travel for several years in Europe. Here he met Booth Tarkington, with whom he collaborated on *The Man From Home* (1908) and three other plays. He was elected to the National Institute of Arts and Letters in 1908. Among his later works of fiction were *Bunker Bean* (1912), *Ruggles of Red Gap* (1915), *Ma Pettengill* (1919), *Merton of the Movies* (1922), and *Two Black Sheep* (1931). He died June 28 at Monterey, Calif.

Windward Islands: see WEST INDIES, BRITISH.

Wines. The 1939 vintage in Europe will go down in the history of viticulture as a great disappointment, not so much from the standpoint of quantity as that of quality. The weather was generally unfavourable, July particularly being unusually cold, and in most sections accompanied by heavy rainfall and even by hail. It improved in spots in September and gave promise of fairly good wines, but broke again shortly after the beginning of the harvest and heavy rains fell almost every day during the vintage.

In France these conditions prevailed more or less throughout the country. The Burgundy district suffered perhaps even more than Bordeaux, the severe weather there resulting in a small as well as a poor crop. Champagnes likewise showed up badly. Bad weather resulted in a late harvest which produced a fair quantity but the wines are light and thin. As a result of these unfavourable climatic conditions, the grapes ripened unevenly, some remaining immature, others starting to rot before they could ripen.

Andalusia, in Southern Spain, where sherries are produced, apparently did not fare so badly although some of the vineyards were affected by the excessive cold of the early part of 1939. The weather was less unfavourable there during the summer and fall than in other parts of Europe, and the harvest was more abundant.

In Portugal cold, dry winds prevailed in July and August and prevented ripening of the grapes. Rain fell intermittently throughout the harvest period and the uneven development of the grapes resulted in an unsatisfactory vintage. The Madeira islands on the other hand report that the weather conditions in 1939 were not unfavourable and the vintage was generally satisfactory in both quantity and quality.

Italy, likewise, fared better, but even here there was too much rain.

In Alsace the 1939 vintage was fairly satisfactory in point of quantity but the quality leaves much to be desired.

Information regarding conditions on the Rhine and Moselle in Germany were not obtainable owing to the war, but it is to be assumed that the weather in the wine-growing districts of Germany was not much better than that which prevailed in the Alsatian vineyards, and that the vintage there, as elsewhere, will show 1939 as a poor year.

The Hungarian wine harvest was mediocre, the wines in the lowlands faring somewhat better, while the Tokays and other high-grade wines grown on the uplands suffered severely through the ravages of diseases of the vines and grapes.

In addition to the unfavourable weather conditions already referred to, practically all the important wine-growing countries of Europe have been labouring under the serious disadvantages caused by the war. Vineyard workers generally have been mobilized and the tasks usually performed by men of long training and experience had to be taken over by old men, women and children.

The reports from the United States of America are more encouraging. The harvests there, particularly in California, have been quite abundant and have kept pace with the increasing demand which has followed the extensive advertising campaign undertaken by the Wine Institute to make the American public wine-conscious.

The vintage in the wine-producing countries of the Southern Hemisphere,—Chile, the Argentine Republic, Australia and South Africa,—takes place in the early part of the year, corresponding climatically to the autumn of the Northern Hemisphere. The 1939 vintages appear to have been fairly satisfactory in both quality and quantity.

Since 1939—in European vineyards—was more or less of a failure, it becomes interesting to know how the wines of the previous year or two have developed. The 1937 European wine crops were generally abundant and unusually excellent in quality. The Bordeaux white wines are outstanding and the red wines, too, are very good. The burgundies, which in the beginning promised well, have lived fully up to expectations and will probably take their place among the great years.

The 1937 champagnes are full-bodied, have developed very well, and are expected to prove excellent when they have attained full maturity. The 1937 port wines show good colour, body and quality, and although not outstanding, will prove useful lodge wines. Alsatian wines as well as the German Rhine and Moselle wines in 1937 were excellent in quality and should prove worthy successors of the 1934s and 1929s.

The 1938 wines, on the other hand, were uneven and unsatisfactory practically all over Europe and will probably never enter seriously into consideration. It is the 1937 wines therefore that will have to be depended upon to maintain the supply for eventual requirements until a better harvest has been produced. (A. Wi.)

Wisconsin, the fifth and last State to be created under the Ordinance of 1787, is popularly known as the "Badger State." It has an area of 56,066 sq.mi., and the population in 1930 was 2,939,006. The capital is Madison, population 57,899; the largest city, Milwaukee, population 578,249. Urban population numbered 1,553,843, all whites except for 9,873 Negroes and 3,692 of other races. The rural population, 1,385,163, contained only 866 Negroes and 10,716 of other races, practically all Indians settled upon reservations. There were 386,213 foreign-born whites. In rural society native whites of native parentage constituted 44% of the whole, native whites of foreign parentage 40.5%. In the urban population, native whites of native parentage were 35.7%, those of foreign parentage 43.4%. The foreign-born made up 20.4% of urban, 14.8% of rural population.

History.—To understand the history of the year 1939 it is necessary to begin with the general election, Nov. 8, 1938. At that time the La Follette Progressive regime in Wisconsin, which had been in power most of the time for nearly 40 years, was overthrown by the Republican party, Julius P. Heil receiving a plurality of 187,000 for governor over Philip F. La Follette, candidate for a fourth term. Other State offices were also filled by the choice of Republican candidates; a Republican, Alexander Wiley, was elected to the United States Senate, and eight of the ten congressmen chosen were Republicans. That party also had majorities in both houses of the legislature, which made it certain that much of the recent Progressive legislation of a highly controversial character would be subject to repeal or modification.

Hygiene and Corrections.—A board of control which governed all penal and charitable institutions was among the boards and commissions which were abolished or reorganized under the authority of a Government reorganization law adopted by the 1937 legislature, at Governor La Follette's instance. Its functions were divided between a Department of Mental Hygiene and a Department of Corrections. By the legislature of 1939 these departments were abolished. Their duties devolved upon the Department of Public Welfare consisting of a seven-member policy-making board, a single director, and under him a head for each of six specified divisions, one of which is mental hygiene, another corrections. The Pension department and Public Welfare department also fall under the same authority. This includes old age, widows' and teachers' pensions; also phases of the relief administration.

The policy of changing the numerous commissions, usually of three persons having equal rank among whom administrative functions were divided, to a one-man directorship was carried out by the recent legislature in creating a department of research, a securities department, a department of agriculture and markets, a motor vehicle department, a department of taxation and several others, as well as the department of Public Welfare mentioned above. It is one of the major new movements and overthrows a policy in which Wisconsin had pioneered since the days of the elder La Follette.

The Wisconsin Development Authority, created by the 1937 legislature under conditions which were highly controversial, was designed to promote and aid in constructing municipal power facilities. A portion of its powers was shorn away by the effect of a supreme court decision handed down on June 21, 1938, leaving the Authority merely certain investigative and promotional functions. The legislature of 1939 abolished the Authority as a

public organ. It continues as a private incorporation designed to supply investigative knowledge and skill.

Agriculture, Manufacturing, Mining.—Wisconsin's agriculture centres in dairying. The product of her farms in 1936, including only crops, livestock and milk, was valued at \$347,000,000, about \$171,000,000 of which was credited to milk reckoned at farm price values. The comparable figures for 1937 were: crops and livestock, \$178,000,000; milk, \$178,000,000, or a total of \$356,000,000. For the year 1938 the returns under the same heads would seem to be approximately \$150,000,000 and \$144,000,000, or an aggregate production of \$294,000,000. Wisconsin leads all States in the production of cheese. Mining, a subsidiary interest, shows flurries of activity at present due to war prices of lead, zinc and copper, and there is always some iron production. Manufactures, which include lumber, paper and pulp, furniture and woodenware, farm machinery, engines, automobiles, electrical appliances, hospital equipment, etc., greatly exceed in value the State's agricultural productions. In 1935 Wisconsin stood tenth in value of manufactures, her aggregate product being valued at \$1,334,913,670. In 1937 the aggregate value of the product was \$1,772,310,417, or an increase of \$437,396,747 over 1935.

Labour Relations.—Wisconsin's workman's compensation law and her more recent unemployment compensation law have created widespread interest among the States. Labour legislation of 1937 consisted mainly in the creation of a Labor Relations Board. The legislature of 1939 abolished that board, creating as a substitute a Wisconsin Employment Relations Board with quasi-judicial powers but stripped of many of the investigational powers of the old board. It limits the definition of a labour dispute to one between an employer and a majority of his employees. It prohibits picketing when no such dispute exists. It bans secondary boycotts, sit-down strikes and strikes affecting perishable farm products, etc. The closed shop is permitted only when 75% of a bargaining group votes for it. Union labour vigorously opposed the law, while several farmers' organizations favoured it. The contest was peculiarly bitter and has left much ill feeling. The legislation is similar to that adopted in several other States which are under Republican rule, thus representing a general trend. (J. Sc.)

Wisconsin, University of. Enrolment (1939-40) remained at the high level set during preceding year, almost 11,400 students, continuing to be the largest resident enrolment in the 90-year history of the university.

The current building program consists of nine construction projects, most of which were either completed or nearing completion as 1939 came to a close. These projects include eight men's and five women's dormitory units, the third wing or theatre addition of the Memorial Union building, a law library, a cancer research laboratory and additions to the Chemistry and Biochemistry buildings and the heating station. The total estimated cost of this entire building program is approximately \$4,000,000, of which only \$148,500 was supplied by an appropriation from the general fund of the State. All of the building projects are scheduled to be completed during 1940. Several of them were completed and put into use during 1939, including the theatre addition to the Union building.

Very close to 2,000 young men and women received their first and higher degrees at the University's 86th commencement in June. This was the largest number ever to graduate from the University of Wisconsin in the school's 90-year history. (R. Fs.)

Woman's Christian Temperance Union.

The fact that more than 39,000 new women joined the organiza-

tion in 1939, that similar increases were made in the two branches, the Youth's Temperance Council and the Loyal Temperance Legion, is warrant that there is increasing interest in the organization's work. Nine hundred and eighty-five new unions were formed, which means almost a thousand new centres of organization to work out the objectives sought—total abstinence from alcoholic beverages, and the abolition of the liquor traffic. The fourth seminar on alcohol education sent additional trained specialist speakers into teachers' colleges. Two motion pictures are in circulation. These deal with the scientific, social and economic effects of alcohol. They are on high school and adult levels. Film strips for classroom use in the grades are available. These deal with health, safety and economics. Exhibits and many varieties of visual demonstrations, serial radio programs largely on safety, were but a few of the special releases of the year. The weekly magazine, *The Union Signal*—a journal of social welfare, and the *Young Crusader*, a children's paper, were increasingly added to libraries, both public and in the schools. Books and pamphlets have been printed in excess of any other year.

The national officers are: Mrs. Ida B. Wise Smith, president; Mrs. D. Leigh Colvin, vice-president; Mrs. Anna Marden DeYo, corresponding secretary; Mrs. Margaret C. Munns, treasurer; and Mrs. Nelle G. Burger, recording secretary. (I. B. W. S.)

Women's Clubs, General Federation of.

The General Federation of Women's Clubs was organized in New York city in the year 1890. Sixty-one clubs were represented. Today the Federation embraces 15,000 clubs with a membership of over 2,000,000 women, including 74 clubs in territories and 35 foreign countries. It is incorporated for \$1,500,000.

Among the programs given special emphasis in 1939 were: a "Good Neighbor" Tour, an imaginary visit to the other republics of the American continent; a Consumer Education program and a weekly consumer broadcast over a national network; a monthly radio forum on current questions of importance; the promotion of public health and public welfare; and a study of the problems of youth, particularly of education in a democracy. The year 1940 marks the 50th anniversary of the Federation, and many special programs have been developed for that Golden Jubilee. The work of the Federation is carried on largely through its nine departments—American Citizenship, American Home, Education, Fine Arts, International Relations, Junior Club Women, Legislation, Press and Publicity and Public Welfare, and through standing and special committees.

"Adjusting Democracy for Human Welfare," is the keynote of the present administration. The officers for the term 1938-41 are: Mrs. Saidie Orr Dunbar, president; Mrs. John L. Whitehurst, first vice-president; Mrs. LaFell Dickinson, second vice-president; Mrs. Horace B. Ritchie, recording secretary; Mrs. J. L. Blair Buck, treasurer. The Federation owns its headquarters, at 1734 N Street, N.W., Washington, D.C. (S. O. D.)

Wood, Henry Alexander Wise

(1866-1939), U.S. inventor, was born in New York city on March 1, son of Fernando Wood, who was mayor of New York for three terms. He was educated at Media academy in Media, Pennsylvania. Wood early interested himself in the mechanical problems of printing newspapers and invented a machine for making printing plates that greatly increased the production speed of publishing large metropolitan dailies. In 1916 he announced a series of inventions that doubled the production of high-speed newspaper presses. Wood was also an accomplished aeronautical engineer and in 1915 served as a member of the U.S. Naval Consulting board. He was first president of the American

Society of Aeronautic Engineers. He founded the magazine *Flying* and was its editor from 1911 to 1919. After the armistice he helped organize the League for the Preservation of American Independence, which bitterly opposed President Wilson's efforts to secure the United States' entry into the League of Nations. At one time Wood accused the President of violating the constitution and urged his impeachment by Congress. He died at New York city on April 9.

Woods, Frederick Adams

(1873-1939), U.S. biologist, was born January 29 at Boston. After studying for four years at the Massachusetts Institute of Technology he enrolled at Harvard, where he received a medical degree in 1898. For four years thereafter he taught histology and embryology at Harvard, and he was a lecturer in biology at M.I.T. from 1903 to 1923. Dr. Woods made many important contributions to the study of heredity and was a pioneer in historiometry—the science of applying exact mathematical or statistical methods to the study of history. He published *Mental and Moral Heredity in Royalty* (1906), *The Influence of Monarchs* (1913), and *Is War Diminishing?* (1915), the latter in collaboration with Alexander Baltzly. He died November 5 in his home at Rome.

Wool.

Estimates of sheep in the world during 1939 were figured at 746,300,000, growing 3,710,000,000lb. of wool. The Australian clip was computed at 1,034,000,000lb.; South America, 616,000,000lb.; United States, 440,088,000lb. (including 65,000,000lb. pulled); New Zealand, 310,000,000lb.; Union of South Africa, 270,000,000 pounds. United States imports of apparel wool totalled 61,000,000lb. in the first nine months compared with 18,000,000lb. during the same months of 1938, when domestic mill consumption was at a low level, and an average of 62,000,000lb. for those months in the five years, 1933-37. The wool consumption for the year was estimated at 672,500,000 pounds. In Great Britain the annual consumption is about 710,000,000lb., although in 1939 wool for civilian consumption declined but was more than offset by large Government orders for war purposes. Germany consumes 420,000,000lb. annually, but with efficient regulation of civilian needs and substitution of rayon and staple fibre in 1939, it lessened its wool requirements by one-third. The annual wool consumption in France is 460,000,000 pounds. Japan's importations amounted to approximately 500,000 bales from Australia, New Zealand and Cape Colony.

World wool prices showed but little change during the first eight months of 1939 with 64s/70s on the London market, averaging 46.6 cents clean cost and U.S. territory fine staple 71.3 cents scoured basis. Domestic wool prices advanced 8 cents to 15 cents a pound, scoured basis, during the first week of September following the outbreak of the European war. The 1939-40 wool sales in Australia were cancelled on August 28 to be followed by an announcement on September 5 that the entire Australian and New Zealand clips would be purchased by the Government of the United Kingdom for the duration of the war and one year afterwards. The New York Wool Top Futures market advanced 160 points the first week in September, spot top advancing 13 cents. The Roubaix-Tourcoing Wool Top Futures market closed on August 31 and the Antwerp market on September 4. The high point in trading on the New York exchange occurred during the six trading days ending Monday, September 26, making a new weekly record of about 9,900,000lb. of wool top, with an advance of 352 points in the most active month. Fine staple wool advanced 32 cents a pound on the Boston market during that period to \$1.10. Manufacturers were obliged to price their fabrics from 40 cents to 50 cents a yard above their August quotations.

Due to heavy consumption of domestic grown fine wools and the

control of the Australian clip of similar grade by the British Government, the United States, commencing in September, purchased 50,000 bales of fine wool from Cape Colony, these wools not having been taken over by the British Wool Control Board. The British Government in September assumed full control of all stocks of wool in England. Maximum prices for all grades and types were established with every wool firm being required to file a return of its stock within five days. Requisitions for stock to be used for civilian purposes were necessary and licences were obtained for delivery.

The British Control Board announced that fine wools from Australia would be allocated to neutral countries for civilian needs. A joint committee, consisting of wool merchants and manufacturers, conferred in New York city with representatives of the British Government relative to the allocation of Australian wools to the United States. On December 1 press releases announced that 10,000,000lb. of wool were available for the United States; no price was named but it was specified that payments be made in dollars rather than in pence.

Sales of wool top on the New York Wool Top Exchange to December 1 were 109,100,000lb. compared with 69,540,000lb. for the same period in 1938. Wool sold through co-operative marketing associations during 1939 amounted to 70,000,000 pounds. At the close of the year the total stocks of domestic combing grease wool in the hands of dealers, co-operatives and growers was estimated at 30,000,000lb. in comparison with a normal carry-over of 150,007,000 pounds. The total amount, including foreign importations, was 259,000,000lb. in comparison with 341,000,000 in 1938. Imports of wool fabrics from England, to October 1, amounted to \$5,916,000; for the like period in 1938, \$3,200,000. (See also TEXTILE INDUSTRY.) (C. M. AN.)

Work Projects Administration: see SOCIAL SERVICE; WORKS PROGRESS ADMINISTRATION.

Works Progress Administration. (Renamed Work Projects Administration.) The outstanding developments in American work relief during 1939 resulted from changes in policy in the Emergency Relief Appropriation Act of 1939. Important characteristics of WPA were changed radically. A large number of WPA workers, both relief and administrative, had to be discharged.

The 1939 law wiped out the prevailing wage principle and required all WPA project workers to work 130 hours per month for their security wage (Sec. 15). This change brought WPA hourly rates considerably below those in private employment, particularly the wages of skilled workmen. Eligibility of aliens was also ended.

The new law also provided that after Aug. 31, 1939, the monthly earnings schedule for workers of the same type should not be varied "in different geographical areas to any greater extent than may be justified by differences in the cost of living." Under the previous schedules of maximum monthly earnings the WPA had taken cognizance of the fact that historically wages in private employment in different sections of the country have differed very substantially. Wages on the Pacific coast, in the east, north central States, and the middle Atlantic States, for instance, have been relatively high; those in the south-eastern and lower Mississippi valley States comparatively low. Under the new rule the long established sectional wage differentials have been disregarded, but the average labour cost per person of the Works Progress Administration remained substantially unchanged.

The Federal allowance of \$7 per month per worker for non-labour costs was cut in 1939 to \$6 per month with a proviso that more than \$6 but not more than \$7 could be allowed to meet increases in the costs of materials. The low allowance for materials

has been intended throughout the history of WPA to force the local governments to furnish most of the materials needed for WPA-aided State and local construction projects. The principle is sound but two facts have been revealed by experience: Insufficient supplies of materials and equipment have made it impossible to keep many WPA crews working steadily, forcing men to idle part of their time because of lack of materials, and the local governments, with the entire burden of outdoor relief on their hands, have in many cases found it impossible to provide adequate funds for WPA materials and equipment. The 1939 reduction of the allowance to \$6 has made it more difficult, therefore, for the poorer communities to finance their share of WPA costs (Sec. 1c).

Another important and closely related provision of the 1939 Act requires that not less than one-fourth of the total cost of non-Federal projects must be borne by the local governments (Sec. 1d). Moreover, no WPA funds can be used for Federal buildings costing over \$50,000 or non-Federal costing over \$52,000, unless the project was approved before July 1, 1939. This provision was intended to end the fear of private contractors that the WPA might cause Government buildings to be constructed by Government "force account" methods rather than through the letting of contracts to private firms.

The administrative appropriation was cut from 5% to 4% of the total WPA appropriation. The practical significance of this change has been two-fold. It has forced the dismissal of many administrative employees and increased the already indefensible amount of unpaid overtime worked by a large number of WPA administrative employees.

The New York Advisory Council recommended that, "There should be periodic separations and re-examinations of all workers to eliminate the establishment of a vested interest in work relief and to compel proof of continued eligibility." This was a concrete expression of the fear on the part of a good many citizens that a large number of people might remain indefinitely on work relief rather than seek private employment. Congress responded to this recommendation with a provision that there should "be removed from employment" on work projects "all relief workers, excepting veterans, who have been continuously employed on such projects for more than eighteen months" and that they could not be reinstated until after the expiration of 30 days and recertification of need by the relief authorities (Sec. 16b). The commissioner was also required to make periodic investigations to eliminate persons not in actual need; each person to be investigated at least once every six months (Sec. 16b).

The allegations that WPA employees were being solicited for contributions to political party campaign funds resulted in drastic provisions forbidding solicitation of such funds from persons paid from WPA funds. Such solicitation is defined as a felony and punishable by fines up to \$1,000 and imprisonment up to a year.

Table below shows employment on projects financed by WPA, 1938-39. The sharp decline in Aug. and Sept. 1939 was due to the heavy layoffs forced by the new law. In July 1939, there were laid off 342,157 and in August, 678,621. Total separations in

Employment on Projects Financed With WPA Funds, United States and Territories, by Month, 1938-1939

1938	Number Employed on Projects	1939	Number Employed on Projects
January 26	1,900,635	January 25	2,895,125
February 23	2,075,402	February 22	2,955,022
March 30	2,445,415	March 29	2,832,722
April 27	2,581,807	April 26	2,629,314
May 25	2,678,223	May 31	2,457,901
June 29	2,806,931	June 28	2,429,741
July 27	2,966,832	July 26	2,143,659
August 31	3,085,762	August 30	1,778,149
September 28	3,136,595	September 27	1,719,870
October 26	3,253,623	October 28	1,825,722
November 30	3,193,658	November 29	2,023,551
December 28	3,002,241	December	

July were 490,551 and in August 782,826. During the same months 131,979 and 292,897 persons were added to the rolls.

(See also AIRPORTS; ARCHAEOLOGY; EDUCATION: *Nursery Schools*; EDUCATION, ADULT; GOVERNMENT DEPARTMENTS AND BUREAUS; ILLITERACY; RELIEF; SCULPTURE; SOCIAL SERVICE; UNITED STATES: *Strikes*.)

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World Commerce: see EXPORTS AND IMPORTS; INTERNATIONAL TRADE.

World Council of Churches: see CHURCH REUNION.

World Court: see PERMANENT COURT OF INTERNATIONAL JUSTICE.

World's Fair, New York: see ARCHITECTURE; ART EXHIBITIONS; ART GALLERIES AND ART MUSEUMS; ELECTRIC LIGHTING; ETCHING; FAIRS AND EXHIBITIONS; INTERIOR DECORATION; LUMBER; MUSIC; PAINTING; SCULPTURE; TOWN AND CITY PLANNING.

World War II: see EUROPEAN WAR.

World Youth Congress: see YOUTH MOVEMENTS.

Wrestling was once a near-major sport in the United States, but every year since 1934 has seen the professional game on the wane. The late John Curley did much to build it up in New York and in a few Eastern cities, but the entertaining aspects of many of the contenders and the pseudo-championship contests billed in many States and cities have caused wrestling to lose both confidence and the interest of many sports fans. After being placed in disrepute when the New York State Athletic Commission and the New Jersey Commission refused to recognize the so-called champions, the sport slipped to further low levels of interest. A few professionals who consider themselves "world champions" in some States and cities are Bobby Bruns, Crusher

"THE ANGEL," a French wrestler born in Russia, had won more than 175 consecutive matches by 1939

Casey, Tom Casey, Abie Coleman, Rudy Dusek, Don Evans, The Great Gama, Maurice La Chappelle, Strangler Lewis, Jim Londos, Danno O'Mahoney, Gus Pesek, Jack Sherry, Gus Sonnenberg, Phil Thesz, Nagurski, Marshall and Gino Vagnone.

Interest in amateur wrestling under the direction and supervision of the Amateur Athletic Union is increasing and excellent progress is being made in practically every section of the United States. The national championships, promoted by the Pacific Association, attracted entries for nearly every district, with the team championship awarded to the New York A.C. In collegiate circles, wrestling flourished throughout the nation. Oklahoma A. and M. won the National Collegiate A.A. title. In the Eastern intercollegiate group, Lehigh once more went through the tourney successfully to win the championship. (J. B. P.)

Wright, Willard Huntington: see VAN DINE, S. S.

Wu Pei-fu (1873-1939), Chinese soldier and scholar. During the years after the World War he was the outstanding leader, "the only honest warlord" in North China. In 1922 he defeated Chang Tso-lin, overlord of Manchuria, but was himself defeated two years later near Tientsin and went into retirement to devote his time to writing and to study. In 1926 he returned to the wars to oppose the advancing forces of Chiang Kai-shek but was routed. Thereafter he remained in seclusion, and the Japanese tried without success to secure his support of a puppet regime in China after 1937. He died at Peiping on December 4. See *Encyclopædia Britannica*, vol. 23, p. 816.

Wyoming, a Rocky Mountain State, was admitted to the Union July 10, 1890, as the 44th State. Leadership in the extension of rights to women gave it the name "Equality State." Wyoming has a land area of 97,548 square miles. The State is second in average elevation with approximately 6,700 feet.

According to the 1930 Census, it had a population of 225,565. Of its population in 1930, 70,000, or 31% were urban; 214,067 were whites; 1,250 were Negroes; and 194,409 were born in the United States. The capital city, Cheyenne, in 1930 had a population of 17,361, and Casper had 16,619.

History.—Elective State officials in 1939 were, governor, Nels H. Smith (R.); secretary of State, Lester C. Hunt (D.); auditor, William Jack (D.); treasurer, Mart T. Christensen (R.); and superintendent of public instruction, Miss Esther Anderson (R.). The Republican party had a majority in both houses of the legislature and had control of administrative boards.

The 1939 legislature combined the State Planning board with the State Conservation board, and gave the new board power to make surveys of water, transportation needs, recreational facilities, soil, adaptability of various parts of the State for crops, range and recreation, mineral resources, possible improvement of the public service, and fish and game. The board is to recommend to the governor a definite program before the meeting of each session of the legislature.

In the 1939 legislative session an effort to remove the sales tax on foods and an effort by the Union Pacific and organized labour to require the use of coal instead of gas in public buildings failed. Preparations were begun in 1939 for celebrating the State's semi-centennial in 1940.

Education.—Wyoming has only one institution of higher learning, the State university at Laramie, which includes a college of liberal arts, a college of agriculture, a college of engineering, a college of education, a law school, a department of military science and tactics, a department of physical education and a division of music. The university enrolment for the school year 1939-40 included 2,044 regular students in residence. There was



a faculty of 160. High school attendance in the fall of 1939 was 14,939.

Mineral Production, Ranching, Manufactures, Agriculture.

—Mineral production ranked first in 1939 with a total value of more than \$150,000,000, using the refined prices for petroleum. Wyoming oil wells produced 23,000,000 bbl. of crude oil. Coal production was 5,600,000 tons; iron ore, 800,000 tons; and bentonite production was valued at \$1,000,000. During the summer of 1939 the Utah Refining Company constructed a 438-mi. pipe line to carry oil from Ft. Laramie, Wyoming, to Salt Lake City, Utah, for refining.

Live stock production was second with a value of \$34,000,000. Wyoming cattle sold for \$16,000,000; sheep, for \$9,500,000; wool, for \$7,903,680; and hogs, for \$600,000. More cattle and sheep than usual were sold because drought conditions in many parts of the State in the latter half of 1939 made disposal of stock imperative. The cattle population declined from 1,000,000 to 750,000.

Manufacturing, excluding oil refining and dairying, produced goods valued at \$25,000,000. Principal products were timber products, metal products, souvenirs, beverages and sugar.

Hay, as usual, was the State's most valuable crop. Value of the hay crop was \$6,335,600. The sugar beet crop brought \$2,673,000. The edible bean crop was valued at \$1,476,280. Corn brought \$1,075,760. Potatoes were valued at \$1,022,560.

Recreation.—It is estimated that 350,000 tourists visited Wyoming in 1939 and spent \$25,000,000 in the State. Hunting and fishing were popular. Lack of snow in the fall of 1939 made big-game hunting more difficult and also limited opportunities for skiing.

(A. T. L.)

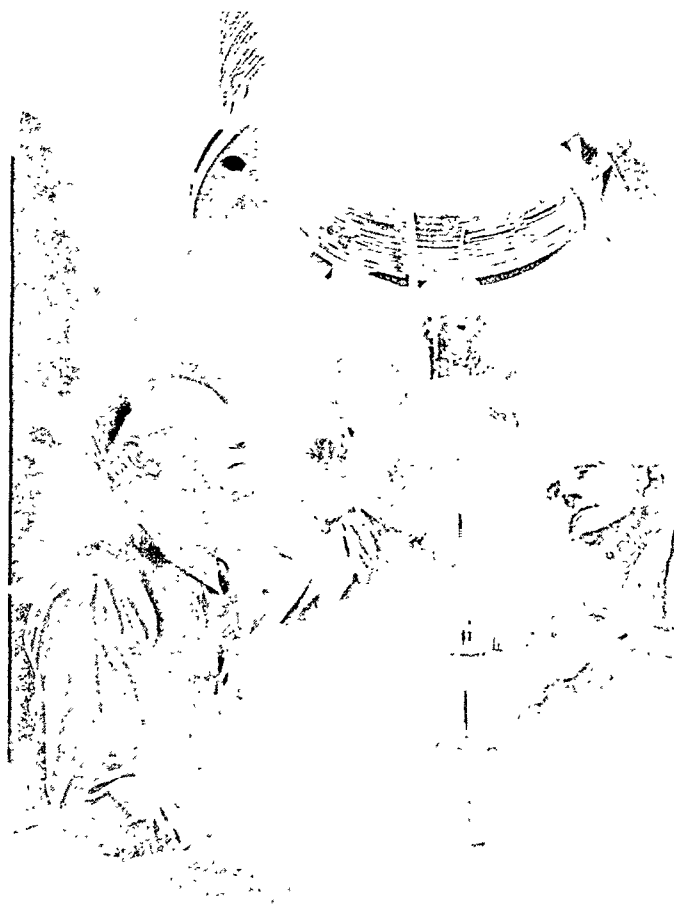
X-Ray.

Important advance was made during 1939 in knowledge of the anatomy and physiology of the heart and great blood vessels and in the diagnosis of disease of the circulatory organs by means of a new method of visualization of the heart and great blood vessels.

The method is the result of research carried out by Robb and Steinberg at the New York University College of Medicine and the Third Medical division of Bellevue hospital. It depends on the injection of 25c.c. to 45c.c. of a 70% solution of diodrast into one of the large veins of the arm and the making of roentgenograms when the chambers of the heart and the blood vessels are opaque to the X-ray. Diodrast is an organic compound of iodine. It depends upon its iodine content for its density and consequent resistance to the passage of X-ray.

The originators of the method have demonstrated that the following structures became visible on the roentgenogram:—the superior vena cava and its tributaries, the four chambers of the heart, the ventricular walls and the interventricular septum, the tricuspid, pulmonic and aortic valves, pulmonic and aortic sinuses, the pulmonary artery and the entire thoracic aorta including its wall and the branches from the arch.

The method appears to be safe and practical and in addition to opening up a new field for investigation of the anatomy and physiology of the heart and blood vessels it also affords means of diagnosis of various diseases of the circulation, which may become very important. It not only has direct value, but the knowledge that it gives of the exact location and configuration of the heart chambers and the position, size, course and relations of the great blood vessels will make it possible to interpret the findings of conventional roentgenoscopy and roentgenography much more fully and accurately than hitherto has been the case. Wm. H. Stewart working with Robb and Steinberg has extended the method just described to the production of moving pictures of the roentgenoscopic image of the heart and blood vessels. By this



MILLION-VOLT X-RAY MACHINE as it was being assembled in Jan. 1939 at Schenectady, New York

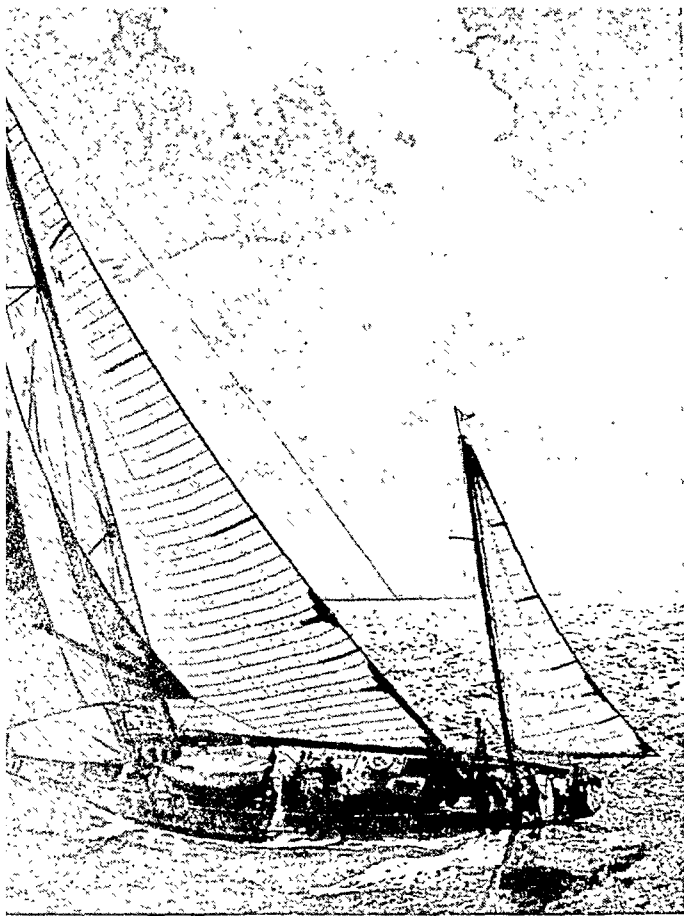
indirect method of cine-roentgenography one may see the opaque blood stream passing through the pulmonary blood vessels, the chambers of the heart and the aorta.

Reports were made during 1939 on the continued use of the method of body section roentgenography variously known as planigraphy, tomography, etc. The value of this method apparently is established, especially in lesions of the larynx, chest, temporo-mandibular joint and the ethmoidal and sphenoidal sinuses. The apparatus for tomography has been greatly simplified so as to render it inexpensive and readily adaptable to any efficient X-ray installation. The rotating anode tube is now an established part of X-ray equipment. The superiority of roentgenograms made with this type of tube over those obtainable with any other type has been fully demonstrated. There are indications that the tube can be simplified and constructed for use even on small machines.

The complete integration of radiology into medical practice is indicated by publication of many articles in journals devoted to general medicine or to one of the specialties which deal with the use of the X-ray in conjunction with other methods for diagnosis of disease. An instance of this is the combined use of the X-ray and the new method of gastroscopy for the diagnosis of disease of the stomach. Greater accuracy is assured in the diagnosis of gastritis and in the differentiation of localized gastritis and cancer and of cancer and ulcer by the combined use of these methods than can be had by either alone. (See also HEART AND HEART DISEASES; RADIOLOGY; STERILIZATION; TUBERCULOSIS.)

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(A. C. CH.)



THE "WAKIVA," a 69ft. yawl, was first across the finish line of the Miami-Nassau race Feb. 14-15, 1939, but the race was won by "Stormy Weather"

Yachting. The outstanding event of 1939 was the Honolulu race which started from San Francisco on July 4. A record list of 26 starters took part in the event with light and changeable winds predominating. An eastern yacht, Richard J. Reynolds' cutter "Blitzen," joined a fine fleet of Pacific coast vessels in the contest and emerged the winner. Harold Judson's cutter "Jorie" and A. L. Marsten's yawl "Brilliant" were second and third respectively. On the Atlantic coast several events during the last two weeks of June unfortunately competed for entries among the growing fleet of cruising and ocean racing craft. The New York Yacht club's race from Newport to Cape May and back to Montauk Point was taken by R. J. Schaefer's big yawl "Edlu." The Annapolis Yacht club's race from New London to Annapolis was won by a dark horse, E. S. Bradford's Alden-designed yawl "Estrella." Only a few hours earlier R. O. H. Hill's little "Lucky Star," a stock auxiliary, had been declared winner in a fleet of over 30 yachts competing in the Eastern Yacht club's annual race from New London to Marblehead.

The long distance classics of the Great Lakes, the Port Huron-Mackinac and Chicago-Mackinac races both attracted record lists, some of the contestants coming from as far afield as Long Island Sound. James R. Lowe's big yawl "Manitou" won the Lake Huron event while the Chicago affair was taken by a nine-year-old sloop, E. B. Lumbard's Rhodes-designed "Bangalore" in the cruising division and A. Herrman's "Gloriant" in the racing class.

The outstanding ocean racing yacht of 1939 was unquestionably the 53-ft. yawl "Tioga Too," designed by John G. Alden for Harry K. and E. Pike Noyes. Her young owners campaigned her most extensively throughout the season, doing exceptionally well against the comparatively small but choice fleets of the Eastern and New York Yacht club cruises and taking prizes in many of

the less famous events for yachts of her type. Her season was climaxed when she led the fleet into Halifax and won by over 12 hours a fog-ridden race which was started at Marblehead, Mass., and was held jointly by the Boston Yacht club and the Royal Nova Scotia Yacht Squadron.

Although even the Star Class International Championship was held in Germany in 1939, the total lack of foreign competition caused no slackening of interest in small boat racing. The traditional race weeks at Larchmont and Marblehead attracted near record entry lists while events on Chesapeake bay, at various centres on the Great Lakes, on the Pacific coast, at Edgartown, Mass., and other centres showed greatly increased interest.

One of the notable yachts of the year was the 12-metre "Vim" designed for Harold S. Vanderbilt by Sparkman and Stephens, Inc. Her model, of course, was tank tested and she was fitted with countless gadgets, a duralumin mast, rod rigging and other refinements, some proven, others experimental.

Among the significant developments of the year were the building of three identical ocean racing yawls to the Cruising Club of America's rule by the U.S. Navy for the use and training of midshipmen at Annapolis. These were designed by A. E. Luders, Jr., and are worthy additions to the navy's growing fleet of sailing craft. Other interesting developments were the rapidly increasing use of radio direction finders and radio telephone equipment on yachts and widening uses of waterproof plywood in hull construction. Small boats built almost entirely of plywood are beginning to appear.

Europe.—In Britain and, in fact, throughout the whole European yachting scene, the most important single event was the visit of America's outstanding racing skipper, Harold S. Vanderbilt, with his new 12-metre "Vim." Four new yachts were built to meet her, the "Tomahawk," "Jenetta," "Ornsay" and "Flica II" which with "Trivia" and "Evaïne," new in 1938, made up as fine a fleet of large racing yachts as has been seen anywhere in a decade. "Vim" sailed 28 races in two months and won 19 first prizes, four seconds and three thirds. T. O. M. Sopwith, Vanderbilt's competitor in the last two matches for the America's Cup, had the second best record of the season. His "Tomahawk" scored six firsts, 10 seconds and five thirds, in 27 starts up to August 9.

The match among six-metres for the Scandinavian Gold Cup, premier small boat trophy of the world, was sailed in 1939 in Finnish waters, the right to defend it at home having been relinquished by the Seawanhaka-Corinthian Yacht club of Long Island. "Goose," winner in 1938, was taken over to defend by her owner, George Nichols, who had the misfortune to fall ill on his arrival in Helsingfors. His son, George Nichols, Jr., however, stepped into the helmsman's cockpit and won three straight races and the cup, defeating seven other "sixes."

Among the other outstanding six-metre events in European waters was the winning of the One Ton Cup by the "Noreg III," owned by Rolf Svinndal and Crown Prince Olaf of Norway. "Noreg III" challenged for the Seawanhaka Cup, but was defeated by J. H. Thom's "Circe," three races to two, in a series sailed on the Clyde.

The long ocean race for the Fastnet Cup was the fastest and one of the best ever sailed. The winner was Isaac Bell's yawl "Bloodhound." The Dutch "Zeearend," the 1938 winner, was second, and the German "Roland von Bremen" was third.

The International Championship of the Star class was held at Kiel in late August under war clouds. Walter von Huchler retained his title with the famous "Pimm." The Italian "Polluce" was second, the German navy's "Muggel" third. (H. L. St.)

Yale University. The close of the academic year 1938-39 marked the end of the first decade of the

Institute of Human Relations. After a careful survey of its accomplishments and its future possibilities the Rockefeller Foundation voted a sum of \$700,000 toward its support for a second period of ten years. The Foundation has also provided \$300,000 for the Department of Psychiatry and Mental Hygiene and the Psychiatric Clinic, and \$85,000 toward the support of the Clinic of Child Development. The Carnegie Corporation has appropriated \$30,000 for the latter clinic. The Laboratories of Primate Biology have been refinanced by the Rockefeller Foundation by an appropriation of \$189,000 over a five-year period and a gift of \$35,000 for the erection of a new physiological laboratory at Orange Park, Fla. Gifts and bequests received by the university during the year ending June 30, 1939, totalled \$4,209,486; gross additions to funds were \$3,819,706, including interest on certain funds; total endowment and reserves are (1940) \$108,718,094, with a net after investment losses of \$100,448,707. In addition, the Sheffield Scientific school trustees have assets of a book value of \$2,038,397.

Outstanding new appointments for the year were: Professor Samuel J. Record, dean of the School of Forestry, succeeding Henry S. Graves, retired; Henri M. Peyre, Sterling professor of French; Professor Ashbel G. Gulliver, acting dean of the School of Law; Richmond Carter Nyman, personnel director.

(C. A. L.)

Yankee Clipper: see UNITED STATES: Aviation.

Yarnell, Harry Ervin (1875-), American naval officer, attained renown in 1938 and 1939 for his repeated refusals to yield before Japanese attempts to curb American commercial and naval privileges in China. He was born October 18 at Independence, Ia., and graduated from the U.S. Naval academy (1897) and from the Naval War college (1915). He was commissioned ensign in 1899 and promoted until he received the rank of rear admiral Aug. 17, 1928. During the Spanish-American war he served on the U.S.S. "Oregon"; he participated also in the Philippine insurrection and the Boxer uprising, and in the occupation of Veracruz in 1914. He was on patrol duty at Gibraltar in command of the U.S.S. "Nashville" during the World War and in 1918 was on the staff of Admiral William S. Sims in London. In 1928 he was appointed chief of the Naval Bureau of Engineering, in 1931 commander of the aircraft squadrons of the battle fleet, and in 1933 commandant of the Pearl Harbor naval station in Hawaii. He was advanced to commander-in-chief of the U.S. Asiatic fleet in 1936 and held this position until he was succeeded by Admiral T. C. Hart in 1939. Upon his retirement, Congress voted him a Distinguished Service Medal.

Yeats, William Butler (1865-1939), Irish playwright and poet, was born at Sandymount, near Dublin, on June 13 and received his early education there and in London. A biography and a critical appreciation of his work appear in *Encyclopædia Britannica*, vol. 23, p. 882. After a period as an art student, he decided at the age of 21 to devote his entire time to writing and to the Irish literary renaissance, then beginning to take form. He was one of the original founders, with Lady Gregory and others, of the Irish Literary Theatre, which established itself in the Abbey theatre in 1904. In 1923 he received the Nobel prize for literature. Among his better known plays are *Kathleen ni Houlihan*, *The Pot of Broth*, *The Hour Glass* and *Deirdre*—all written for performance at the Abbey theatre. His simple, mystic lyrics and his elaborate verse plays are testimony to his poetical versatility. His later work included *Dramatis Personae* (1936), an autobiography; *Words for Music, perhaps* (1932), *Wheels and Butterflies* (1934), *Full Moon in March* (1935), and *Essays* by W. B. Yeats (1938). On Yeats's 70th birthday, in 1935, John Masefield, the poet laureate,

called him "the greatest living poet." Yeats died at Roquebrune on the French Riviera January 28.

Yemen: see ARABIA.

Young Men's Christian Association.

The World's Alliance of Young Men's Christian Associations was formed in 1855. It is composed of 36 autonomous national alliances and associations in 28 other countries affiliated informally. The headquarters of its world's committee and executive are located at Geneva, Switzerland. Its 21st world's conference met in Mysore, India, in Jan. 1937. A World's Young Men's Conference met at Amsterdam, following the World Conference of Christian Youth in June 1939. Reports from all countries (Jan. 1, 1939) showed 10,500 associations with 1,960,226 members, predominantly young men and boys. A body of secretaries or professional workers numbering 6,002 was reported. Concerns of immediate importance to the alliance include the menace of war, participation in direct war-service by various national alliances, and preparations for service to war-prisoners under World's Alliance auspices; the contribution of Christian youth to a Christian world order; public questions affecting the place and opportunity of youth; and the emergence of a universal Christian community. Publications: *Youth in the New World*, *Flaming Milestone*, *World's Youth*, a quarterly journal, are published by the World's Committee, Y.M.C.A., Geneva; *Y.M.C.A. Year Book for 1939*, National Council, Y.M.C.A., New York. (O. E. P.)

Young Men's Hebrew Association and Young Women's Hebrew Association: see JEWISH WELFARE BOARD.

Young Women's Christian Association.

The year 1939 marked for the Young Women's Christian Association in the U.S.A. a period of increased service to women and girls at home as well as of intense concern for the needs of their suffering sisters in war-stricken countries. The recreation, education and fellowship programs of the more than 1,500 local centres were participated in by nearly 3,000,000 women and girls. Eighteen summer conferences were held for the various constituent groups, such as business girls, industrial girls, Girl Reserves and students, directed toward the developing of more effective citizens. Summer schools and institutes were also held for training leadership. Of particular importance were the 10 regional conferences held in various sections of the country for the purpose of making possible during the interim year between national conventions discussion of Association interests in more homogeneous groups. The total attendance at these conferences was 3,184. An important service in 1939 was the assistance given to local Y.W.C.A.'s, through the organizing of a National Y.W.C.A. Committee on Refugees, in educating public opinion on this subject. In the summer of 1939, 176 Y.W.C.A. representatives from 27 countries attended the World Conference of Christian Youth at Amsterdam, Holland.

Fifty-three countries are related to the World's Y.W.C.A., headquarters at Geneva, Switzerland. In 1939 it continued to raise special funds for China to help the Association there meet the many emergency needs as well as carry on its normal program. In addition, financial assistance was rendered to Associations in several European countries facing crises because of the war situation. (M. S. Ss.)

Youth Movements are an organized effort at political, cultural, and social self-expression of

young peoples. In totalitarian States these youth movements are strictly regimented and made completely subservient to the aims of the State. In Germany an ordinance on April 5, 1939, established the all-inclusive conscription of all boys and girls between 10 and 18 years old for service in the Hitler Youth which took exclusive charge of the physical, mental and moral education of the entire German youth. Thus voluntary membership was abrogated, and service in the Hitler Youth became as compulsory as service in the labour army and in the military forces. Before the issuing of this ordinance it was estimated that of the about 11,750,000 young people in Germany from 10 to 18 about 7,000,000 belonged to the Hitler Youth. All other youth organizations, including Catholic organizations, have been long abolished.

A similar organization of the Italian youth was carried through in Italy concurrently with the general reform of the Italian educational system according to the plans of the minister of education, Giuseppe Bottai. In the Soviet Union the Communist youth organizations remain on a voluntary basis.

The International Socialist Youth Movement met for its sixth congress in Lille, France, and discussed the problem of peace, of the struggle for democracy and of protection for the working class youth. The movement unites 64 organizations in 28 countries with 287,929 members.

The American Youth Congress met in New York at the beginning of July 1939. Its session was very much troubled by violent discussion of the so-called "ism"-issue. A compromise resolution condemning all dictatorships was accepted, and the official creed adopted by the Congress concluded with a formal pledge to the flag of the United States. The subsequent development in the foreign policy of the Soviet Union and the new attitude of the Communist Party against the popular front-co-operation with liberal and progressive forces caused an increase in the anti-communist feeling in the American youth movement. The congressional committee for the investigation of un-American activities, headed by Representative Martin Dies, examined the American Youth Congress for alleged communist influence and "fellow-travellership." The annual convention of the American Student Union in Dec. 1939 at Madison, Wisconsin, defeated a resolution condemning the action of the Soviet Union against Finland. (See also SALVATION ARMY.) (H. Ko.)

Yugoslavia, area 95,558 sq.mi.; pop. (est. Dec. 30, 1939) 15,703,000. Chief towns (pop. census 1931): Belgrade (cap. 266,849); Zagreb (185,581); Subotica (100,058); Sarajevo (78,173); Skopje (68,334). Ruler, King Peter II; premier, M. Tsvetković; languages, Serbo-Croatian and Slovene the chief; religion, Serbian Orthodox 48.70%; Roman Catholic 37.45%; Mohammedan 11.20%.

History.—Although at the elections of Dec. 1938 the electoral system had given the Government a large majority of seats in the chamber (306 to 67 Opposition), the voting had been close (1,643,783 to 1,364,524). Many of the Government party themselves felt the necessity of a new policy, and when early in February one member of the Government made a very strongly Pan-Serb speech five of his colleagues resigned. On February 4 the Government was reconstructed with M. Tsvetković, one of the five dissidents, as premier in place of M. Stoyadinović. It was at once announced that the Government meant to solve the Croat question; it was understood also that it hoped to return to more constitutional methods. Serbo-Croat negotiations began at once, but many difficulties arose, including that of delimiting the Serb and Croat areas. On April 27 it was announced that agreement had been reached, but later stated that the prince regent had refused his consent to the agreement, which included provision for a representative government of concentration. Only on August 25,

after feeling had risen very high, were fresh proposals sanctioned. A new Government was now formed, including five members of the Government party, five representatives of the Croat party, and three of the Serb opposition. M. Tsvetković remained premier and M. Cincár-Marković foreign minister. The two Croat Banovinas, with seven adjacent districts, amounting to 20% of the area of Yugoslavia, with a population of 4,423,000, of whom 3,052,000 were Croats and 360,000 Serbs, were formed into a new Banovina under a Croat Ban (appointed and dismissible by the crown), and with its own diet at Zagreb. The Banovina enjoyed very wide autonomy, but foreign affairs, defence, foreign trade, public security, religion, commerce, transport, mining, weights and measures and general educational policy were reserved to the central authorities. The first Ban was M. Šubašić. Parliament was dissolved and the Government empowered to hold new elections. The agreement was hailed with very wide-spread enthusiasm, although it left many questions to the future: the organization of a Slovene Banovina, the position of the Vojvodina, Montenegro, Macedonia, and above all of Bosnia and Hercegovina, a bone of contention among Serbs, Croats and Moslems. These problems had not been solved by the end of the year, although the organization of the Croat Banovina itself had proceeded apace. The only elections held (November 12) were for the senate. The official candidates were elected unopposed in each Banovina, except that of Zeta (Montenegro).

Foreign Policy.—In February it was stated that foreign policy would be unchanged, but the departure of M. Stoyadinović was generally interpreted as meaning less enthusiasm for Germany and more for the democracies. Visits were, however, exchanged between the Yugoslav and Italian foreign ministers, and Italy's occupation of Albania was taken quietly. Yugoslavia continued efforts to reconcile Bulgaria and to mediate between Rumania and Bulgaria, and also between Rumania and Hungary, with whom her relations improved remarkably. On the outbreak of the war she declared her intention to remain neutral. (N. MAC.)

Education.—In 1937-38: elementary schools 8,727; scholars 1,393,422; secondary schools 320; scholars 156,287; universities 3; number of students 16,207.

Banking and Finance.—In dinars: revenue, ordinary (est. 1939-40), 12,947,000,000; expenditure, ordinary (est. 1939-40), 12,947,000,000; public debt (March 31, 1939), 24,620,000,000; notes in circulation (Sept. 30, 1939), 9,107,973,000; gold reserve (Sept. 30, 1939), 1,986,836,888; exchange rate (Aug. 1939): 190.00-207.56 dinars = £1 sterling.

Trade and Communication.—Foreign trade 1938 (merchandise): imports 4,975,341,932 dinars; exports 5,047,433,484 dinars; imports (Jan.-Aug. 1938) 3,455,900,000 dinars; imports (Jan.-Aug. 1939) 3,382,800,000 dinars; exports (Jan.-Aug. 1938) 3,132,200,000 dinars; exports (Jan.-Aug. 1939) 3,416,600,000 dinars. Communications 1938: roads, State 6,374mi.; other roads 19,671mi.; railways, open to traffic 6,591mi.; aviation: passengers 7,600; goods and luggage carried 137,906 kilograms; motor vehicles licensed: cars 13,561; trucks, buses, etc., 5,229; cycles 7,661.

Agriculture, Manufactures, Mineral Production.—Production 1938 (metric tons): maize 4,755,873; (1939) 3,694,200; wheat 3,029,937; (1939) 2,869,200; potatoes 1,701,672; beet sugar 557,444; barley 421,259; (1939) 433,600; oats 326,726; (1939) 346,200; rye 227,102; (1939) 244,800; bauxite (crude ore) 406,368; coal 450,412; lignite 5,286,781; iron ore (metal content) 300,000; pig-iron and ferro-alloys 58,457; steel 220,000; copper (raw) 41,993; wine 4,672,157 hectolitres; silver 78,509 kilograms; gold 2,436 kilograms; hemp 55,399; tobacco 15,847; flax (fibre) 12,917; wool 15,200; chrome ore (chromic oxide content) 28,000; antimony ore (metal content) 3,670; lead (refined) 8,646; zinc (raw) 4,642.

Labour.—Index of employment (average 1929=100) (average 1938) 121.70; (July 31, 1939) 128.20; unemployed, registered (average 1938) 22,517; (Aug. 31, 1939) 15,952. (See also BALKAN ENTENTE; EUROPEAN WAR; LITTLE ENTENTE.)

(W. H. Wn.)

Yukon Territory, the most westerly of the northern territories of Canada, was created a separate territory in June 1898, by Act of Parliament (the Yukon Act). It has a total area of 207,076 sq.mi., and a population of 4,000 (estimate, Dominion Bureau of Statistics, 1935). At the height of the gold mining boom (1901) the population was 27,219. The seat of government is Dawson.

By amending legislation provision has been made for a local Government composed of a chief executive, the controller, and an elective legislative council of these members with a three year tenure of office. The controller administers the government of the territory under instructions from the governor-general-in-council.

Mining is the chief industry, closely followed by trapping, and some fishing. In 1936 the Yukon (together with the Northwest Territories) produced 50,344 fine ounces of gold, 1,053,733 of silver and over 40,000 fur pelts.

(J. T. C.)

Zanzibar and Pemba: see BRITISH EAST AFRICA.

Zemgals, Gustav (1871–1939), Latvian statesman who was president of the republic from 1927 to 1930, was born in Courland, then a part of Czarist Russia, on August 12. Educated at Riga and Moscow, he became a well-known lawyer in the former city. He proclaimed the independence of Latvia on Nov. 18, 1918, and was elected president on April 8, 1927, to succeed Jan Tschakste. See his biography in *Encyclopædia Britannica*, vol. 23, p. 942. He died January 7 at Riga.

Zinc. Of the current world zinc output, one-half of the producing countries account for 90% of the total, and the other half for 10%. The details for the major countries are shown in the accompanying table.

World Production of Zinc
(In thousands of metric tons)

	1929	1932	1936	1937	1938
Australia	50.8	53.7	70.6	70.9	70.9
Belgium	197.9	96.3	195.3	225.6	210.0
Canada	78.1	78.2	137.6	143.9	155.7
France	91.6	49.3	53.6	60.4	62.2
Germany	102.0	42.0	136.4	163.3	192.5
Norway	6.4	40.1	45.0	41.3	46.5
Poland	169.0	85.0	94.3	109.3	108.0
U.S.S.R.	3.4	13.7	65.0	70.0	80.0
United States	573.0	193.7	474.6	534.9	414.6
United Kingdom	59.2	27.3	61.8	63.1	56.2
World Total	1,472.8	789.9	1,489.3	1,667.9	1,589.3
Ex. U.S.	899.8	596.2	1,014.7	1,127.8	1,167.0

World zinc output dropped by 5% in 1938, to a total of 1,589,300 metric tons, the decrease being chiefly in the United States and Belgium, partially offset by increases in Germany, Canada and Russia.

Production during the first half of 1939 was back almost to the 1937 level, with increases in the United States, Canada and Germany somewhat more than balanced by decreases elsewhere.

Primary zinc production in the United States in 1938 decreased by 20%, to 446,300 short tons, 2% of which was from foreign ores; 79% was distilled zinc and 21% electrolytic; in addition there was a recovery of 112,000 tons of secondary zinc, although not all of this was in metallic form. Preliminary estimates for the 11

months of 1939 indicate an output of 538,000 short tons in 1939, an increase of 18% over the 1938 rate.

The zinc industry in the United States has been practically self-contained, exports and imports being negligibly small, but a reduction in tariff of \$6 per ton of zinc in ore, and \$7 per ton of slab zinc, effective Jan. 1, 1939, increased the consumption of foreign zinc in 1939 to about 15% of the total.

British Empire zinc ore production centres in Australia, Canada, Newfoundland and Burma; Northern Rhodesia has a small output, and Great Britain still less, though the latter's metal production is increased by the smelting of Australian ores. Empire production of zinc in ore is 29% of the world total, but the metal production is only 18%, due to the exportation of Empire ores to other countries. The distribution of ore and metal production in 1938 was as follows, in long tons:

	Zinc Content of Ore	Smelter Output of Metal
United Kingdom	11,500	55,000
Northern Rhodesia	12,500	10,200
Canada	185,000	153,500
Newfoundland	65,900	...
Burma	54,900	...
Australia	219,800	69,800
Total	549,600	289,500

(See also METALLURGY.)

(G. A. Ro.)

Zog 1 (1895–), former king of Albania. Ahmed Beg Mati, or Zogu, was born on October 8, in Albania, and was educated at the Military Academy, Constantinople. For his early career, see *Encyclopædia Britannica*, vol. 23, p. 960.

On April 27, 1938, King Zog, the only Moslem monarch in Europe, married at Tirana the Hungarian Countess Geraldine Apponyi, a Catholic; the Italian Government was represented at the wedding by the foreign minister, Count Ciano. On April 5, 1939, Zog's son and heir, the crown prince Skander, was born at Tirana. Two days later the public rejoicing was abruptly terminated by the Italian invasion of Albania. On April 8 Zog fled the country and joined the queen and her three-day-old son in Greece. Later he and his family and retinue went to Istanbul, whence he addressed a futile letter of protest to the League of Nations. From here they travelled to Bucharest, then to Sweden, and in June rented a villa at Versailles, France.

Zoological Gardens. Dr. Mann of the National Zoological park at Washington took back emus from the London zoo, and sent in exchange rare North American birds and a cacomistle or ring-tailed cat. The New York zoo acquired a "tygon," a cross between a Siberian tiger and an African lion. At the Brooklyn zoo, an elephant hurled himself into a moat in which his mate was killed, but was hauled out safely.

Great Britain.—Before war started, gate receipts at the London zoo increased by £7,000, due largely to the presence of Ming, the baby giant panda. When war began, the zoo closed for ten days, Ming and other valuable animals were evacuated to Whipsnade, the aquarium was emptied and poisonous snakes killed. Valuable records were sent to Woburn Abbey and the staff drastically cut. An adoption scheme was initiated, resulting, by the middle of December, in the adoption by animal lovers of 150 animals. Sung, the giant panda, died in December. Mr. D. Seth-Smith, known to thousands of children as a broadcaster, is to retire.

Whipsnade zoo also closed at the outbreak of war for a week and again on November 1, for four months, partly to develop waste land for growing food for the animals.

At Dudley, Mrs. John Vinden presented tropical fish. Surplus stock was sold when war came and arrangements made for killing animals in the event of release as a result of air-raids. At Bristol, two polar bears were shot and their dens made into shelters; the

aquarium was emptied. The Belle Vue gardens at Manchester were closed and so was Primley zoo, at Paignton, whose owner, Mr. Whitley, presented much of his stock to the London zoo.

Mr. Partridge presented a collection of birds to the Chester zoo and an adoption scheme was begun. All wild animals at the Kursaal zoo, Southend-on-Sea, were destroyed and Chessington zoo arranged for wild animals to be shot in an emergency.

In May, the Glasgow Zoological Society bought Calder Park estate for a zoo. At Edinburgh, dens were strengthened with concrete and sand-bags to withstand possible air-raids.

Many animals were evacuated to Dublin zoo, which also received African snakes from Lieut. Col. O'Doherty.

Europe.—Moscow Zoological park celebrated its 75th anniversary. Two young chimpanzees, sent from London, were exchanged for a snow-leopard. Copenhagen zoo, Denmark, closed for an outbreak of foot-and-mouth disease in March.

The Paris zoo closed when war broke out and valuable animals, including a giant panda and aquarium specimens, were evacuated to safer French zoos.

In Germany, elephants, camels, yaks, and oxen were impounded by the Government, to act as draught animals. Carnivores in the Hamburg zoo were destroyed, but at Munich less valuable animals were fed to the others, in the hope that the most valuable will survive the war. At Dresden, the dens of slaughtered carnivores were turned into air-raid shelters. Fish-eaters at Berlin and Hamburg were killed, their skins cured and their blubber converted into oil. Snake venom, fat and skins from reptiles in the Berlin zoo were utilized, but Dresden's famous collection of boas and pythons was spared. Edible fish from the big aquaria were sent to the markets. (V. R.)

Zoology.

General.—The American Society of Zoologists held its annual meeting at Columbus, Ohio, on Dec. 28, 29 and 30, 1939. At that meeting 309 papers were listed of which 26% were devoted to general physiology; 21% to embryology; 14% to endocrinology; 13% to ecology, morphology, and miscellaneous; 12% to cellular physiology; 7% to protozoology; and 7% to cytology and histology. In addition, animal genetics was represented in meetings of the Genetics Society of America by 36 papers and animal ecology in meetings of the Ecological Society of America by 32 papers.

Major Trends.—The year 1939 witnessed general trends in zoology that were largely continuations of research already in progress. Certain of these trends may be indicated as follows:

(1) There seemed to be a growing interest, coupled with collaboration, on the part of geneticists, embryologists and biochemists in the analysis of chemical aspects of differentiation and growth. Important examples were investigations dealing with (a) the chemical and structural nature of the gene; (b) the chemical properties of embryonic "organizers"; and (c) the role of hormones in development.

(2) There was a continuation and sharpening of interest in the study of animal populations. This subject was attacked actively along two frontiers. The geneticists, interested primarily in matters of evolution and speciation, were concerned with the statistical distribution of genes within single species populations under specified conditions of selection, mutation, isolation and population size. This aspect of zoology received formal recognition at the summer (Milwaukee, Wis.) and winter (Columbus, Ohio) meetings of the American Association for the Advancement of Science where speciation symposia were conducted. The ecologists continued their analyses of the growth and dynamic structure of field and laboratory populations. An important synthesis of work in this province was published by Thompson. There was evidence of a growing realization on the part of many zoologists that certain biological problems are populational in character and must be analyzed by treating a homogeneous group of organisms as an integrated whole.

(3) Zoology continued to develop as a quantitative science. Mathematical rationalizations and statistical treatment of data appeared frequently in research reports. A book entitled *Quantitative Zoology* by Simpson and Roe was published.

Specific Contributions.—*Morphology and Taxonomy.* One of the most spectacular scientific events of recent years had its origin on board a commercial fishing trawler off the coast of South Africa. While dragging nets in 40 fathoms of water, fisher-

men hauled in a large bony fish about five feet long and weighing over 125 pounds. On expert examination it was found that the fish belonged to a group, the Coelacanth, thought to be extinct for 50,000,000 years. In short, a truly "living-fossil" had been found. Zoologically there are two significant features in this catch. One feature remains an unanswered question: How has such a species been able to survive in the face of competition for so long a time? The other feature concerns the report of palaeontologists who, after studying the carcass and comparing it with fossil Coelacanth found in Bavaria, reached the tentative conclusion that there had been little evolutionary change between the modern form and its earlier progenitors. The fish was named *Latimeria chalumnae* and, at last report, was deposited in the museum of East London, South Africa. (See also MARINE BIOLOGY.)

Embryology.—An important contribution to experimental parthenogenesis appeared in the work of Pincus. This investigator collected unfertilized ova from the reproductive tract of female rabbits by subjecting them to hormonal treatment which induced superovulation. These eggs were then cultured *in vitro* and activated (*i.e.*, artificially induced to divide) by hypertonic salt solutions and supranormal temperatures. Some of the eggs started to develop even though they had not been fertilized by a spermatozoön. The developing eggs were then implanted in the uterus of another female rabbit that had been rendered physiologically capable of implantation by copulation with a sterile rabbit buck. Certain of these implanted eggs formed embryos and were born as normal young. The latter, interestingly enough, were children that never had a father and were born of a mother not their own. The new feature of this work was the successful activation of a rabbit's ovum by experimental treatment.

Genetics.—The significant event in the field of genetics for 1939 was the Seventh International Genetical Congress held at Edinburgh, Scotland, August 22 to 30. (See also GENETICS.)

Animal Behaviour.—A study published by Allee, Collias and Lutherman is particularly significant because it presages an important type of work yet to be developed. These investigators were able to modify experimentally a well established and complex behaviour process by the injection of vertebrate male hormone, testosterone propionate. It has been known for some time that a social order or "hierarchy" exists in flocks of hens. Such an order is established in the flock by dominant or despot birds pecking, and continuing to peck on contact, subordinate birds. This results in a group whose behaviour is shaped by the peck relations between the flock members. Once established, these peck relations may be quite persistent.

It follows that for any flock certain individual hens are consistently persecuted. Allee and his associates injected these low-ranking hens with male hormone to see if their social status, as evidenced by the pecking behaviour, could be improved. It was found that injected adult hens gradually rose under continued treatment to a place where they dominated the entire flock. In addition to altering the pecking behaviour, testosterone (a) caused the comb of the hens to increase in size; (b) retarded or suppressed egg-laying; (c) caused the hens to crow; and (d) stimulated certain hens to court other females. The major importance of this investigation, however, lies in its suggestion that behaviour problems can be attacked experimentally through endocrine manipulation. (See also AQUARIUMS; BACTERIOLOGY; ENTOMOLOGY; OCEANOGRAPHY; PALAEONTOLOGY.)

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